2015 Water Levels

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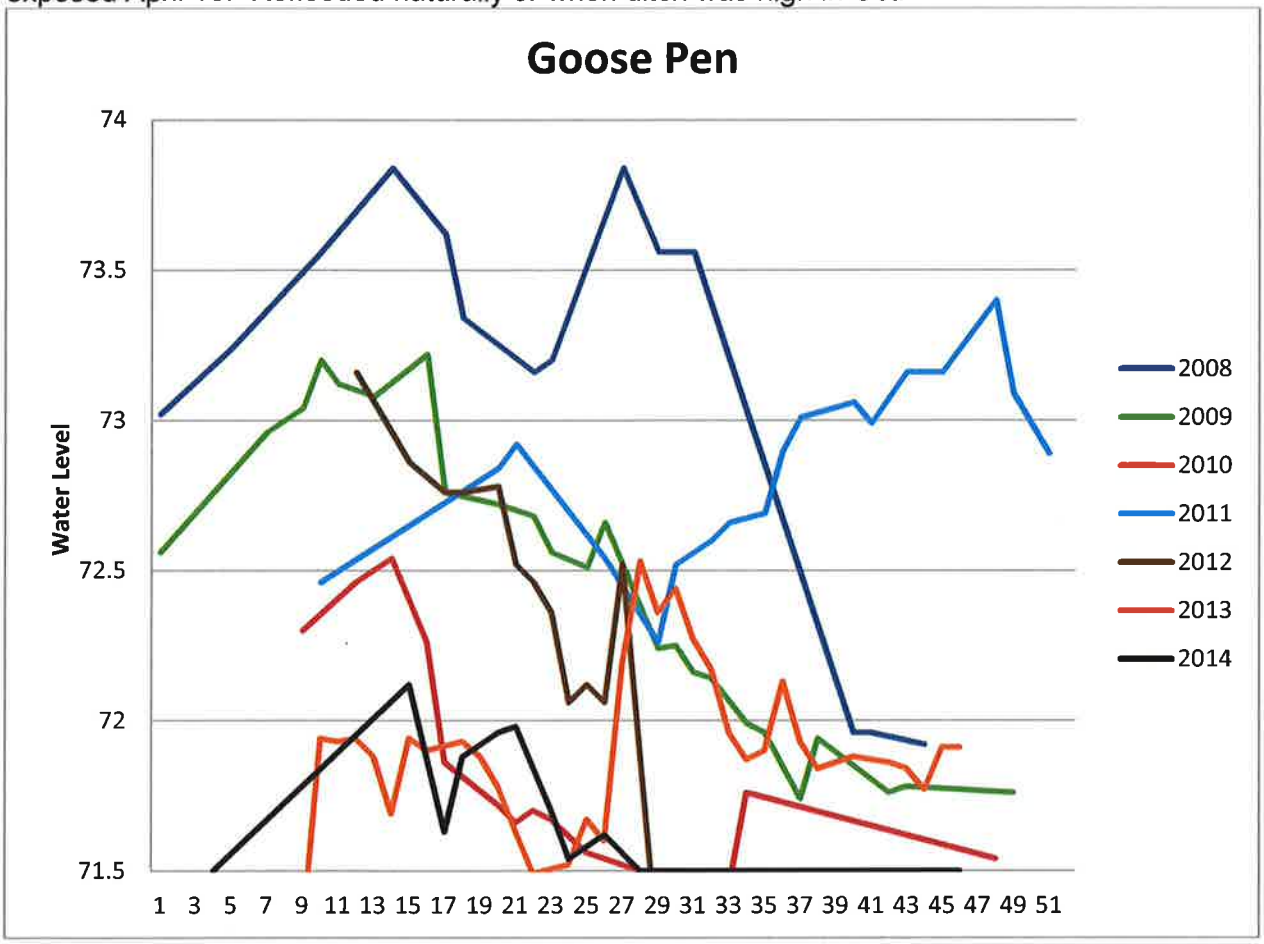
Unit: Goose Pen

Acres: 52.9

2014 Activity: Structure failed and removed in April, unit dried up except for NE pool. Currently no water control. **2013 Activity:** Aerial spray for invasives and shrubs. **2012 Activity:** Unit drew down due to drought. Insufficient water source in ditch to add water.

Draw Down Years: 2013-2014-stucture failure, 2012-drought, 2010- drawn down in April unable to reflood until 2011. 2009 - low water allowed evapotranspiration to expose mudflats on high ground areas in September (0.48); 2006 – March through September draw down. 50% mudflats exposed April 10. Reflooded naturally or when ditch was high in Oct.



Unit Goal: Provide foraging and resting habitat for migratory birds.

Objectives: Control exotic flowering rush and purple loosestrife, and tree invasion (cottonwood and willow). Encourage more desirable vegetation. Put in a rotation for fall shorebird habitat.

Strategies: Fill to full pool by pumping if possible. Cottonwood becoming established. needs control by spraying, disking, or flooding. Recovery may require waiting until Pool 1 GLRI restoration, with planned agridrain from Pool 1-Goose Pen for water source.

Management Strategy Constraints: The east dike is in bad shape. There is a French drain under the road that goes to the check station that allows the ditch next to Magee's entrance road and shop to drain. When the unit is too high, water backs up and threatens the Magee shop/garage. During high spring lake levels in conjunction with lots of rain the culvert under our entrance road is too small and water backs up in the drainage ditch and floods Magee's entrance road and prevents Goosepen from draining. 2.0 is full pool & will begin flooding state.

Repairs Needed: I. Water control structure failed and removed.

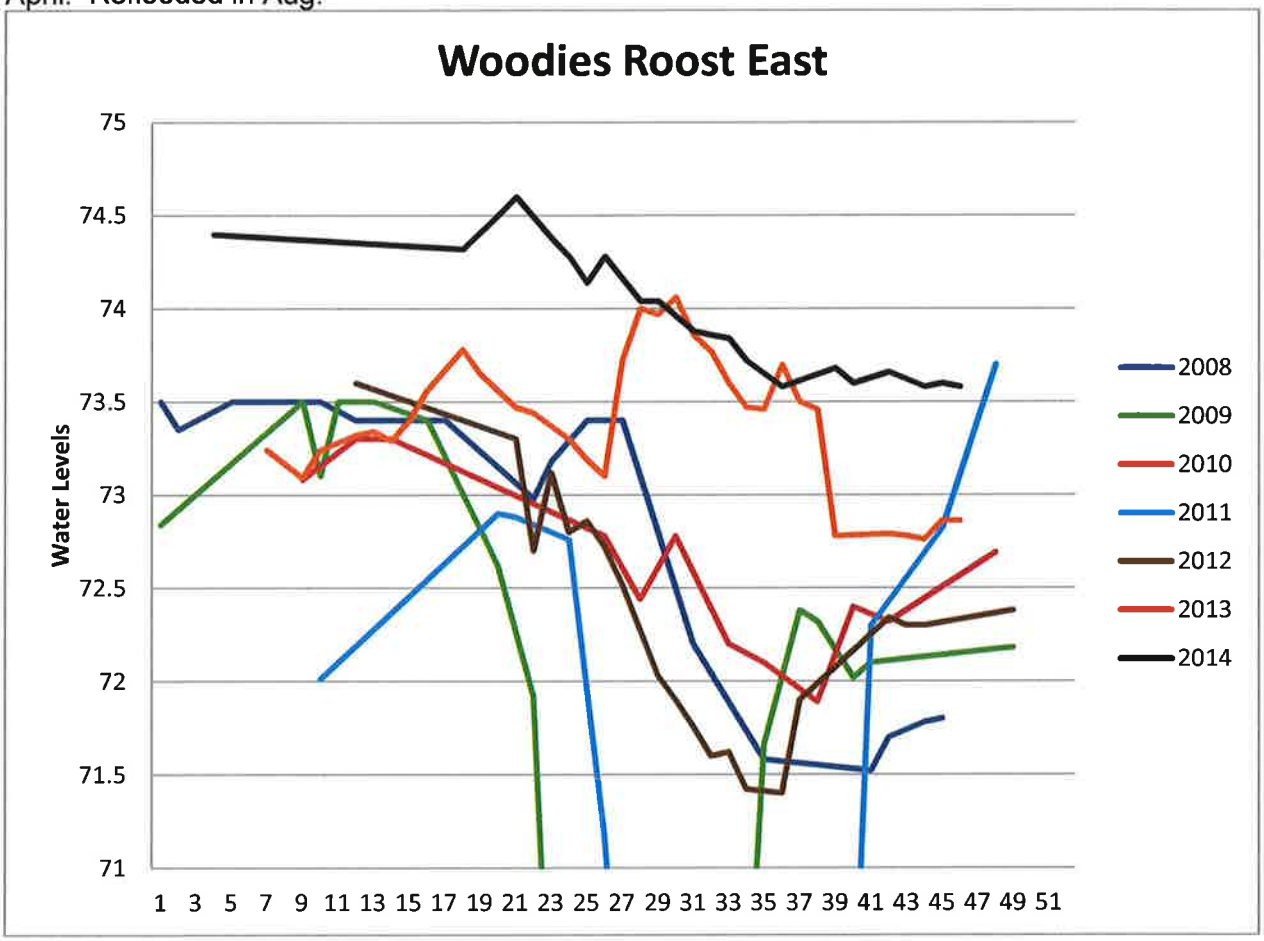
II. East dike in bad shape, and portions of west dike. Needs IGLD gauge.

Unit: **Goose Pen:** 2.0 is full pool (1' free board on east dike – dike in bad shape). CF:0=71.26

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
Old	new			old	new	Fill with portable pump if possible to 573.
			Jan.			
			Feb.			
2.0	73.26					
			Mar.			
			Apr.			
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

Unit: Woodies Roost East

Acres: 63.2, additional area south of WR west will flood and flow out agridrain above full pool. **2014 Activity:** Water levels deeper than normal due to winter melt and cool summer. **2013 Activity:** June-July rains flooded area to south of WR west, WCS between east and west managed as open most of year to provide additional water to WR west. Lowered in fall for waterfowl hunts. **2012 Activity:** Water was pumped in though the states ditch in early October for hunts. New IGLD staff plate set in August. 2011 note: Water is too low for waterfowl hunts at 2.1 muck was in front of blind. Desired water level has changed from 1.7-1.9 to 2.4 due to movement of the staff gauge.
Draw Down Years: 2011 – due to dike construction. 2009 – drawn down mid April, completed by May 30th, flood mid Aug great millet germination; 2006 – drawn down mid march, completed mid April. Reflooded in Aug.



Unit Goals: Provide foraging habitat and cover for wading birds and waterfowl, provide quality waterfowl hunting habitat. Backwater areas provide quality habitat for wood ducks and BCNH.

Objectives: Spring shorebird/moist soil seed production and watch invasives.

Strategies: Drawdown in spring (March-April start), mudflats by May for shorebirds and moist soil production, reflood in August-September for hunting. Coordinate with Magee for water supply.

Potential Problems: Beaver, fixed leaking gate on the north side in 2009, coordinating management with Magee's activities may require timing adjustments; this unit has a watershed to the south & will gain more water during rain events.

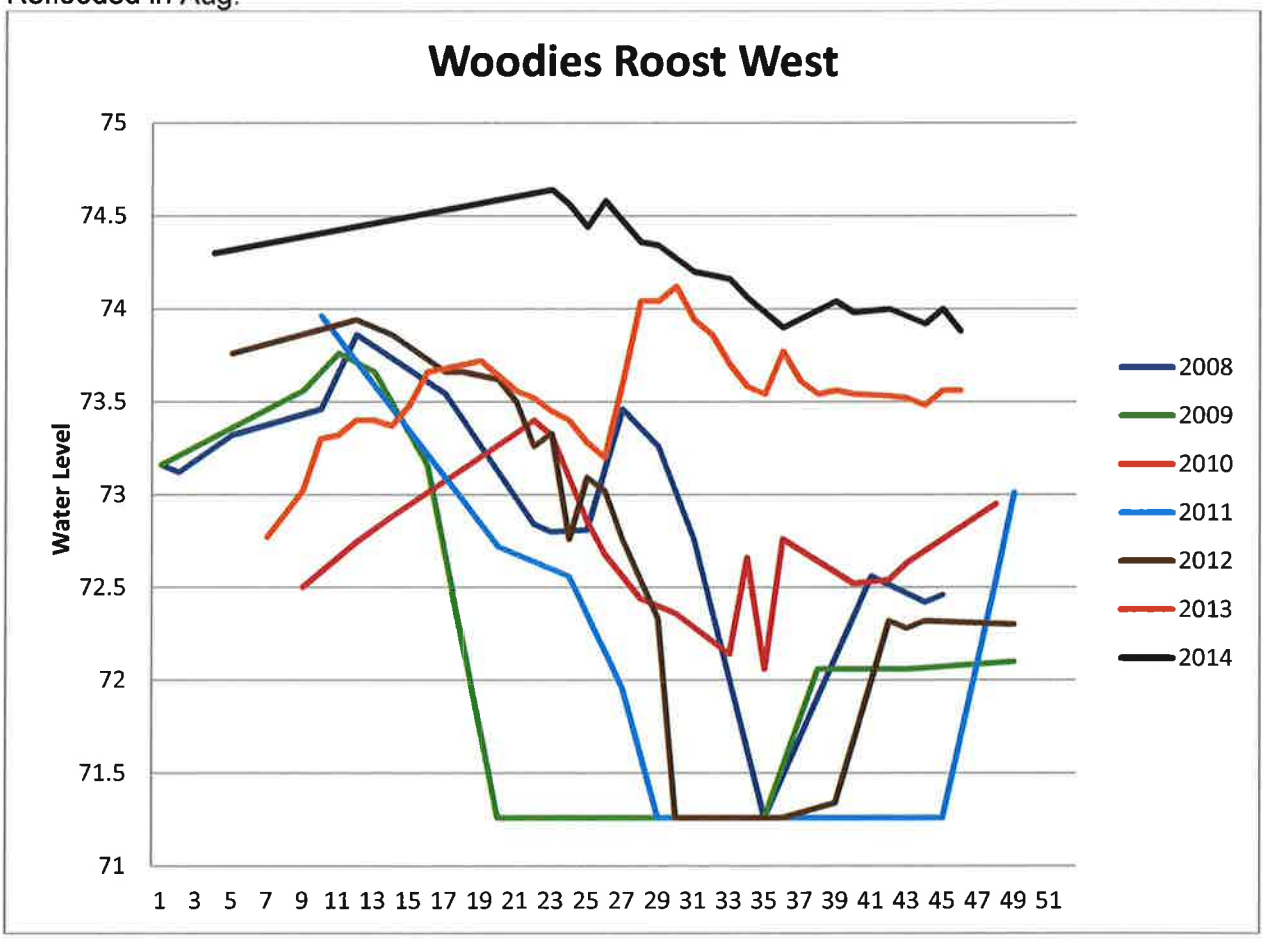
Repairs Needed: Rat holes in north dike need repaired.

Unit: **Woodies Roost East** – Full Pool-TBD CF: 0=70.0

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
Old	new			old	new	March-April drawdown, reflood Aug-Sep for
			Jan.			waterfowl hunting. Verify Magee can provide water.
			Feb.			
			Mar.			
2.7-3.0						
			Apr.			
2.7-3.0						
			May			
			June			
			July			
			Aug.			
			Sept.			
2.40			Oct.			
			Nov.			
			Dec.			

Unit: Woodies Roost West

Acres: 99.2, not all is flooded due to high spots with trees
2014 Activity: Deep water held all year to reduce dense vegetation and encourage muskrats, smashed cattail openings in fall with MM; some cattails sprayed. **2013 Activity:** WCS to WR east open most of year for water supply. Mowed areas of west end. **2012 Activity:** Unit drew down due to drought. New IGLD gauge set in NE corner in August. Reflood in August, but could not reach full pool
Draw Down Years: 2012-drought, 2011 – construction of dikes. 2009 – drawn down mid April, completed by May 30th, flood mid Aug; 2006 – drawn down mid march, completed mid April. Reflooded in Aug.



Unit Goals: Provide foraging habitat and cover for wading birds and waterfowl.

Objectives: Manage toward more hemi marsh conditions, increase vegetation diversity.

Strategies: Evaluate progress towards reducing dense cattail stands. If indicated, continue to maintain maximum level with pumping to open up dense emergent vegetation and encourage muskrat populations. Free flow water from Woodies Roost East when possible to reduce pumping costs. Evaluate for new hunt blind locations.

Potential Problems: Portable pump needed to maintain full pool.

Repairs Needed:

I. Reslope south dike + rock, along borrow area.
II. WCS on N side needs repair, culvert rusting out and leaking. Patched around pipe 2013 with clay.

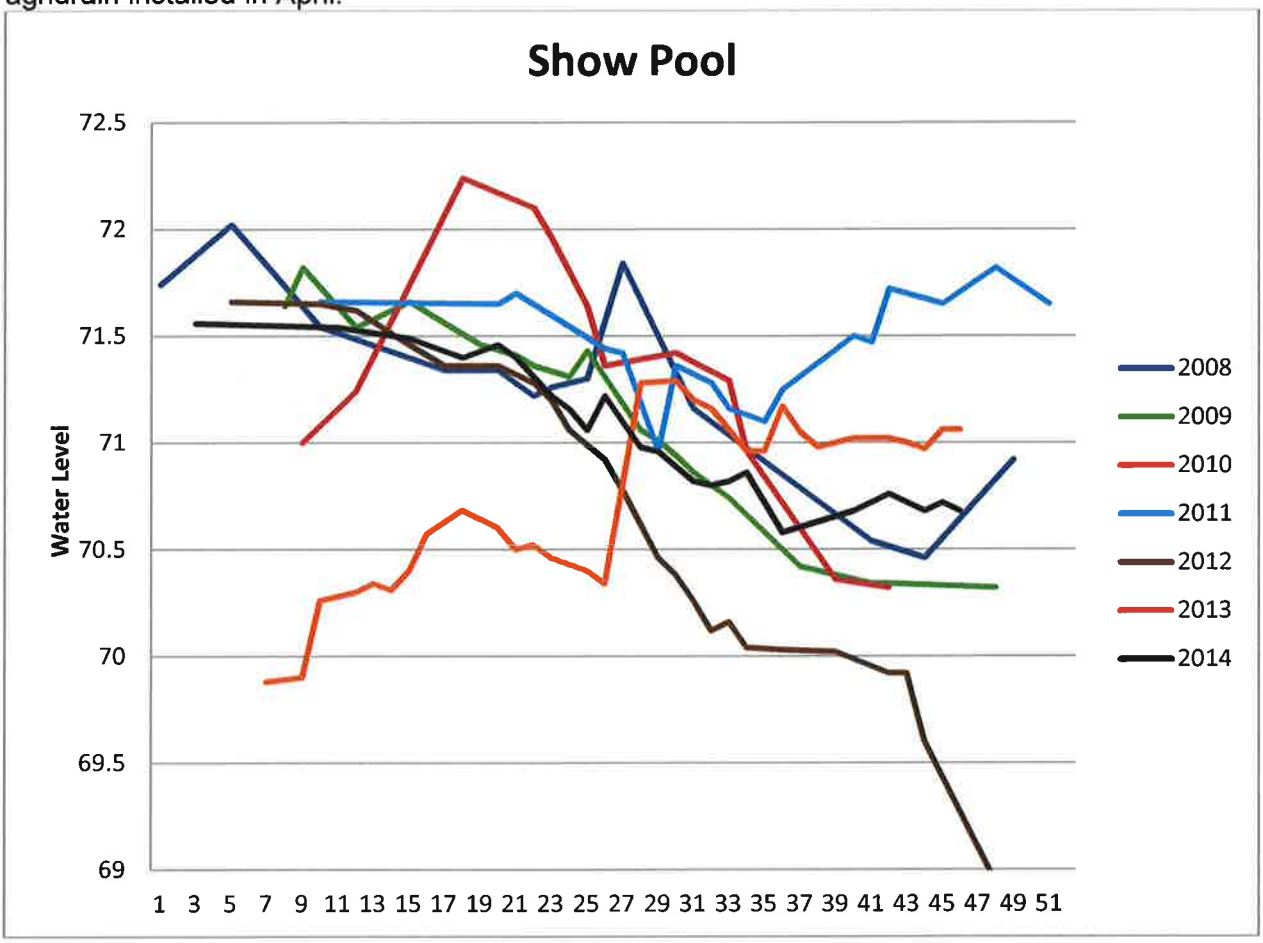
Unit: **Woodies Roost West** – Full pool TBD. CF 0=71.28 (needs verified)

Desired water level		wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Evaluate vegetation growth, and maintain full pool
			Jan.			574 if dense vegetation, pump as needed.
			Feb.			
	74.0+		Mar.			
			Apr.			
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

Unit: Show Pool

Acres: 34.8, includes woods east of shop that flood.
2013-2014 Activity: Natural hydrological cycle. **2012 Activity:** Unit dry except borrow areas due to drought, IGLD staff plate set but is incorrect.

Draw Down Years: 2012-drought, only water in borrow, 2009-Evapotranspiration resulted in water only existing in borrow areas in mid-September; 2005 – similar conditions as in 2009; 2004-agridrain installed in April.



Unit Goal: Provide habitat within limitations imposed by south dike

Objectives: Increase diversity and interspersion of emergent marsh vegetation and provide deep water for fish habitat.

Strategies: Maintain full pool by pumping if possible, otherwise natural hydrological cycle. Monitor dikes, woods behind shop, and water depth on higher ground. Treat invasive species. Phrag patches need sprayed in unit.

Management Strategy Constraints: East dike and south dike weakest/lowest of unit. Max water level is 572.2. Ideally, we'd have more water in showpool. The problem is low lake levels and lack of a water source. Future plans may need to think about dredging NS radar ditch or consider managing for other habitat types (ie – scrub/shrub)

Repairs Needed:

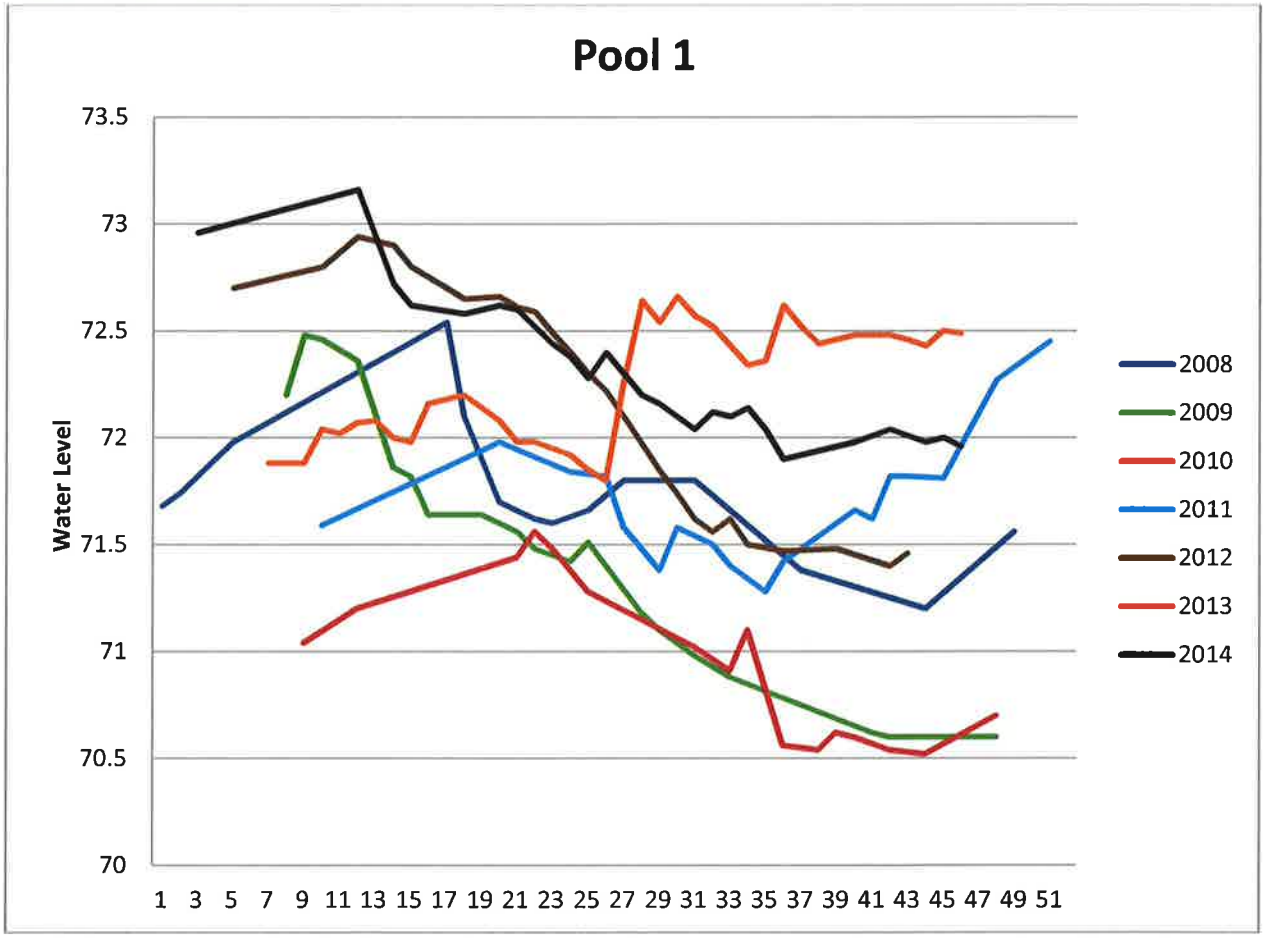
I. Reset IGLD staff plate to correct elevation, DU survey Jan 2015 gauge 71.00=572.76 actual. Above graph does not reflect actual elevation, CF=+1.26.
II. East dike shared with goose pen is getting high muskrat damage
III. South dike likely permeable when water is high, consider future management before repairing

Unit: **Show Pool** - Agridrain 15 ¾" wide. Max water level is ~~5.60~~ 5.48

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Maintain water level >571 by pumping if possible.
			Jan.			Otherwise natural hydrological cycle.
			Feb.			
			Mar.			
>5.5						
			Apr.			
5.48						
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

Unit: Pool 1

Acres: 339.1, includes small beach ridge north of unit, some high areas may remain at max pool.
2014 Activity: Removed some high water in spring through Magee, water flow impaired by beaver and Magee culvert. **2013 Activity:** Natural hydrological cycle. **2012 Activity:** Water levels reached 3.24 feet in spring, which strained common dike with state. One hole patched by state in common dike. High levels not removed in spring, which proved beneficial in drought year by maintaining water in the unit throughout the year.
2011 Notes: Water was at good level most of the year but record level rainfalls made this unit deeper than normal in November and December. At 2.5 the water level in front of hunt blind 1 is 3 ½ feet deep.
Draw Down Years: no record



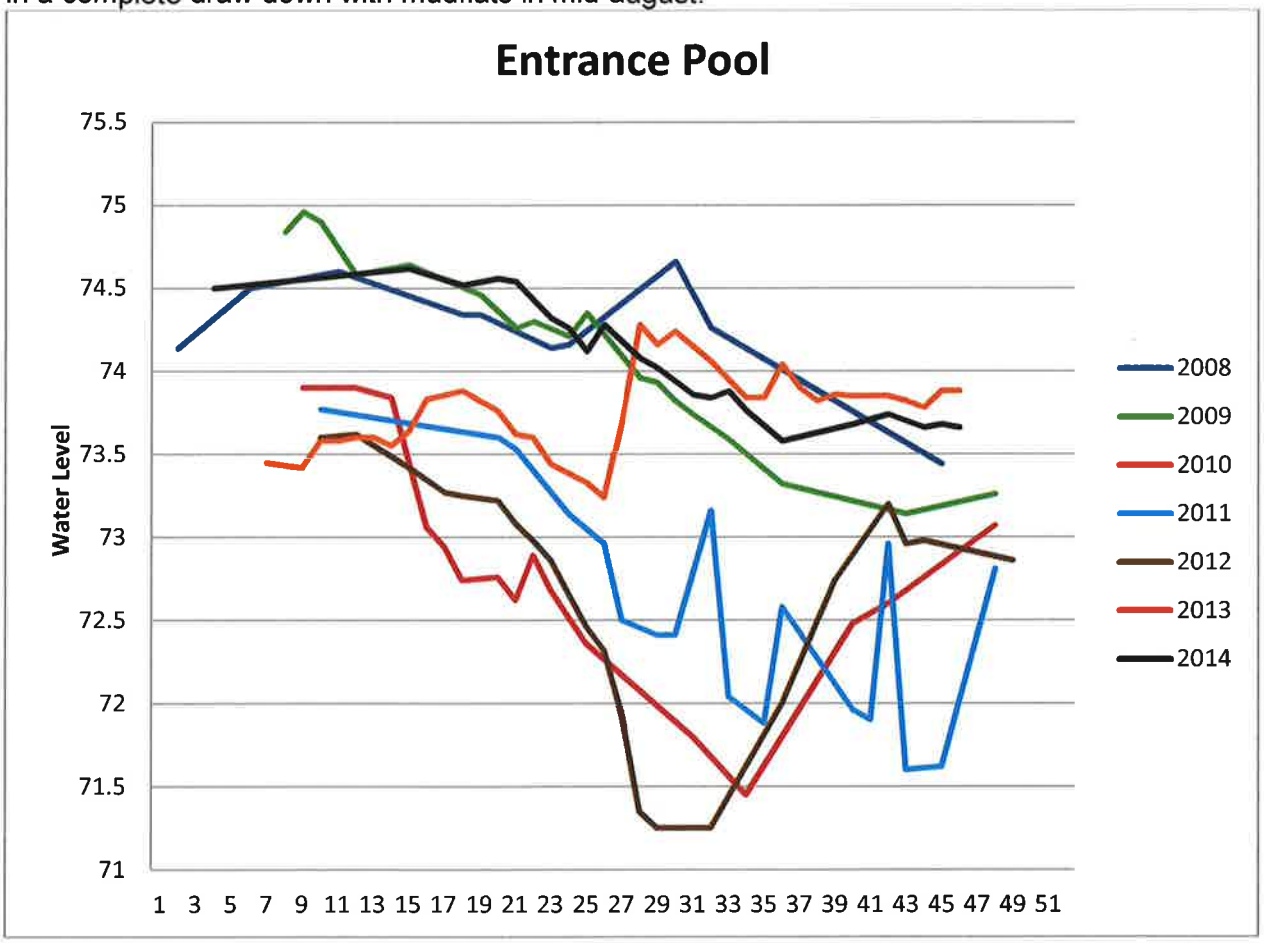
Unit Goal: Provide habitat for nesting common terns and marsh birds (i.e., rails, bitterns), foraging/loafing habitat for wading birds (i.e., herons, egrets) and waterfowl, freshwater mussel habitat areas, and fish habitat.
Objectives: The topography of this unit allows for a variety of water level depths throughout the unit. To provide habitat for nesting common terns, fish and mussels, maintain deep (3-4ft) open water areas. Provide emergent and submergent wetlands for wading birds, waterfowl and invertebrates. The higher elevation areas along the south and north parts of the unit will provide flooded cattails, grass and sedge areas for rails.
Strategies: Remove high water in spring if possible, then natural hydrological cycle. Adjust strategies as necessary: based on expected 2016 GLRI restoration construction, may want to remove high water in fall by pumping.
Management Strategy Constraints: Screw gate on west side not able to close – it keeps coming off of frame. Gate to lake is closed. Pump not operable.
Repairs Needed: DU Jan 2015 survey of gauge 572.20=573.12 actual, need to reset. Above graph does not reflect actual elevation, CF=+0.92. GLRI restoration funded to address issues.

Unit: **Pool 1** – Max Pool about 73.0. CF:0=69.7 (approximately)

Desired water level		wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Spring target <72.5, natural hydrological cycle.
			Jan.			Remove high water in fall in prep for 2016 restoration
			Feb.			
			Mar.			
2.3-2.4	72.1					
			Apr.			
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

Unit: Entrance Pool

Acres: 58.9 approximate flooded area, additional area shallow water at high unit levels
2014 Activity: Habitat conditions improved through prior year management and full pool water levels. Muskrat populations exploded. Openings smashed with MM. **2013 Activity:** Natural hydrological cycle. State MM mowed openings, additional areas smashed. **2012 Activity**: Dry by summer due to drought. State mowed openings with marshmaster, then reflooded in September for fall migration.
2011 notes: This unit fluctuated a lot by the end of the year because of a board that was pulled sometime in May or June without our knowledge. Rainfall and a leaking structure made this unit fluctuate highly.
Draw Down Years: 2011-summer due to drought. 2010 – D.D. in June tried reflooding in October but there was not enough water to free flow needed to pump with a Thompson. 2009 - evapotranspiration resulted in a draw down with water only remaining in channel along Entrance Rd; 2007 - evapotranspiration resulted in a draw down with water only remaining in channel along Entrance Rd; 2005 – Construction (new stoplog structure) and evapotranspiration resulted in a complete draw down with mudflats in mid-august.



Note: 1.0 (73.16) = water only in channel.
Unit Goal: Provide a diversity of marsh type habitats, ranging from emergent vegetation, to open water. Attract a variety of waterfowl, shorebirds, water birds, and wetland animals to provide opportunities for wildlife viewing. Control exotic invasive species.

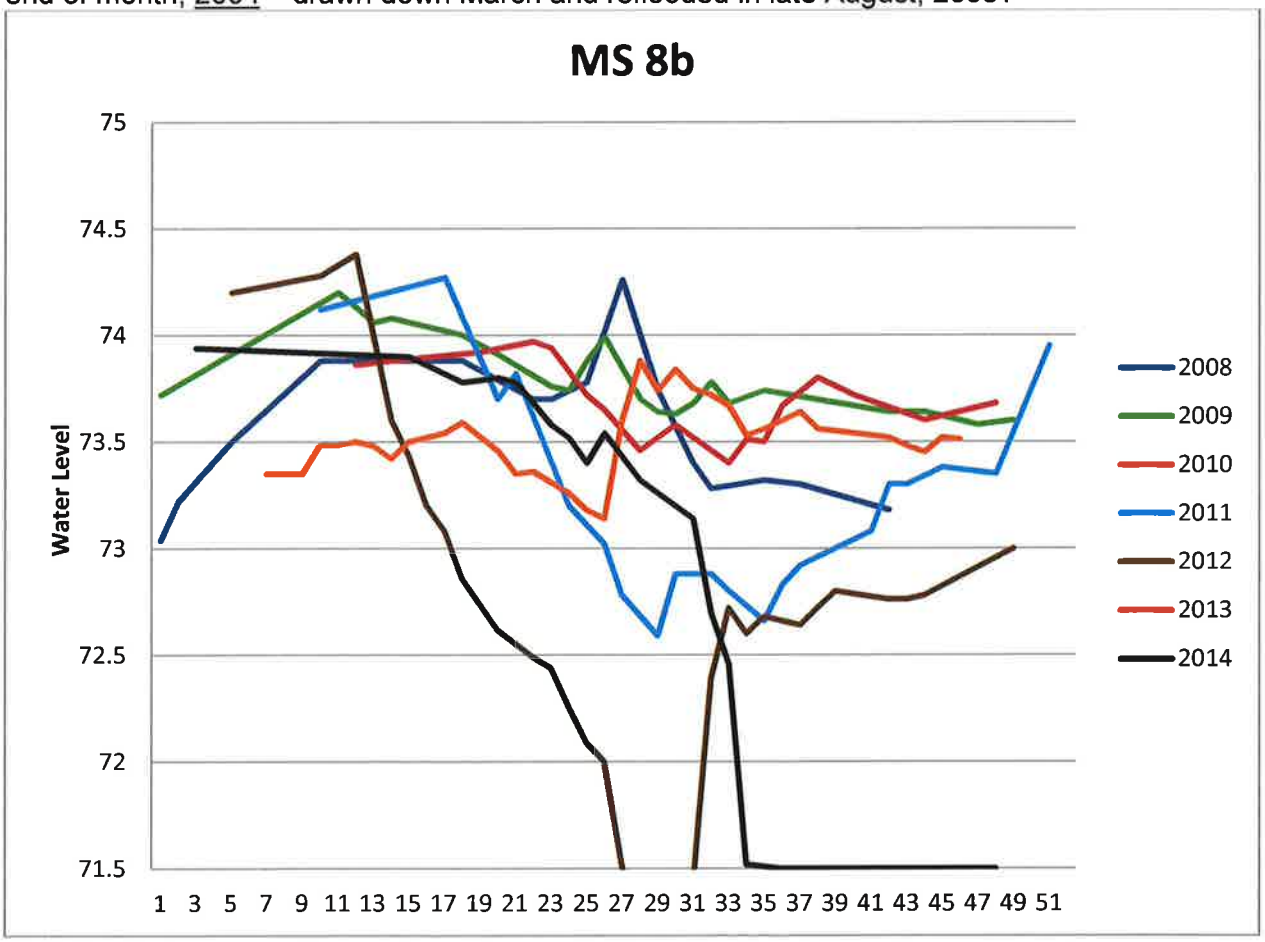
Objectives: Provide shallow to deep emergent marsh. Maintain higher water levels to combat purple loosestrife.
Strategies: Habitat conditions are improving, bur-reed stands developing. Evaluate effect of high muskrat populations on vegetation. Maintain water levels by pumping if dense vegetation conditions warrant.
Management Strategy Constraints: Water can only be added by using a portable pump.
Repairs Needed: Check Boards make sure they are functioning.

Unit: **Entrance Pool** Full pool TBD. CF: 0=72.16

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Evaluate vegetation growth, and maintain full pool by
			Jan.			portable pump if needed. Target level >73.8, check
						boards set for this level.
			Feb.			
			Mar.			
<1.7						
			Apr.			
1.0?			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
1.28						
			Nov.			
			Dec.			

Unit: MSU 8B

Acres: 92.2
2014 Activity: Summer drawdown for GLRI restoration, good shorebird/wading bird use. Agridrains installed to MS 8a and Pool 2c. Pump electric service repaired, installed floats. **2013 Activity:** Full pool. **2012 Activity:** Partially dewatered for spring shorebirds, allowed to naturally drawdown in summer. Used marsh master to smash openings in vegetation. Excellent food plants—nutsedge, nodding smartweed, barnyard grass. Added shallow water in July/Aug for fall for migration.
2011 notes: Water was at desired levels from March-June but then structure was left open without authorization until mid-July.
Draw Down Years: 2014-summer-winter for construction, 2012-2011-spring shorebirds and moist soil plants, fall reflood, 2005 - drawn down briefly in June for construction and reflooding began by end of month; 2004 – drawn down March and reflooded in late August; 2003?



Unit Goal: Provide resting and foraging habitat for migratory birds. When restoration is complete, provide water storage and supply to Pool 2c.

Objectives: Manage against invasive species and develop more open areas in the marsh.

Strategies: Reflood unit in spring. Maintain high water levels in the unit throughout the growing season. This will likely require periodic pumping and active management. Monitor for invasive issues from drawdown.

Management Strategy Constraints: Seeding/erosion protection of new agridrain locations.
Repairs Needed: Pump structure waterman gates need adjustment, and water leaks out if both gates are not fully closed.

Unit: **MS 8b** - Full pool 73.86 – CF: 0=70.4.

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Reflood when possible in spring to full pool, maintain
			Jan.			>573.5 through growing season by pumping.
			Feb.			
			Mar.			
3.4/21.5"						
			Apr.			
			May			
			June			
3.4	73.7					
			July			
3.4	73.7		Aug.			
			Sept.			
3.4	73.7					
			Oct.			
3.4	73.7					
			Nov.			
			Dec.			

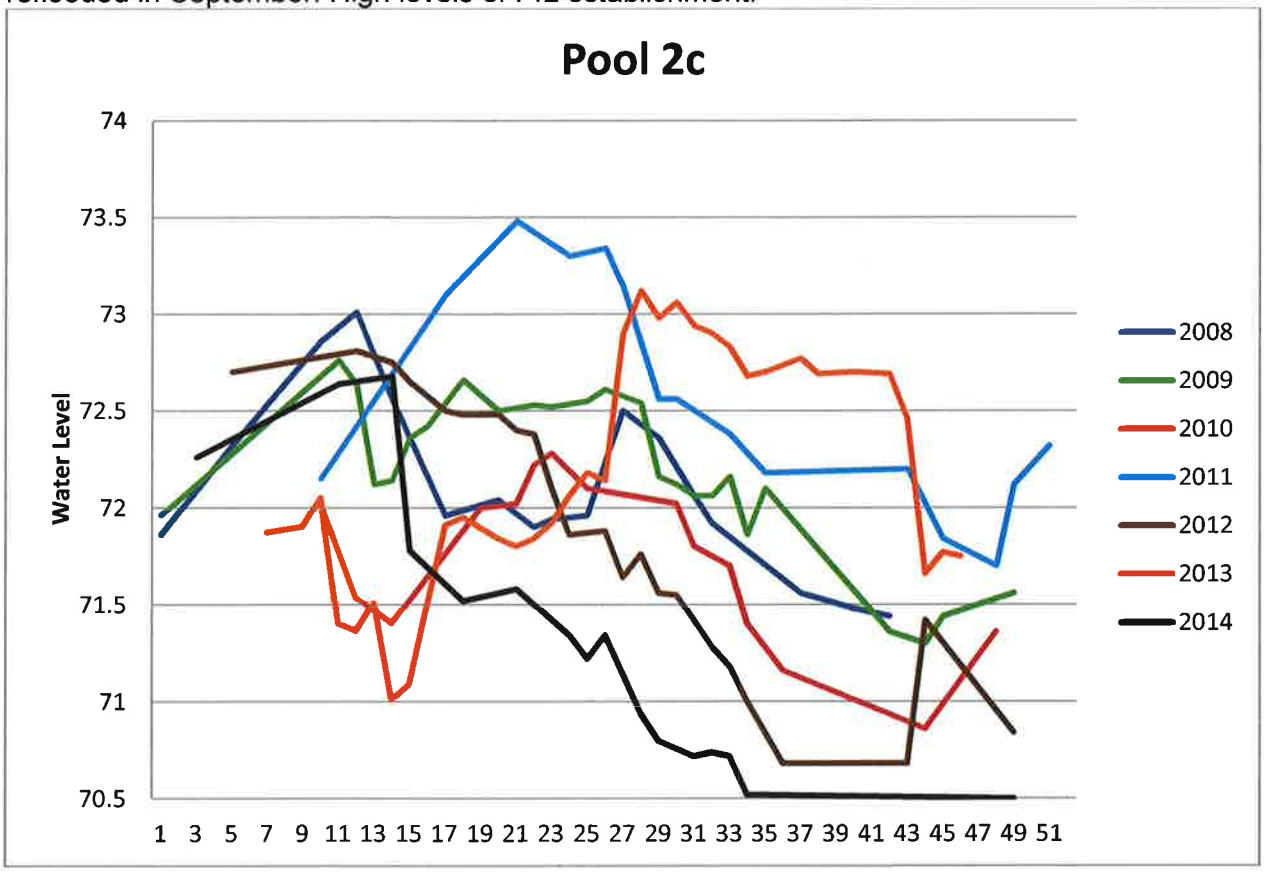
Unit: Pool 2C

Acres: 84.5

2014 Activity: Summer drawdown for agridrain installation to MS 8a and MS 8b. Insufficient funds for planned fish passage installation, re-evaluating. **2013 Activity:** Set gates to capture seiches after carp spawn completed. Partial fall drawdown for migration and set up for 2014 construction. **2012 Activity:** Same strategy as 2011, but unit became low in fall due to lower lake levels and drought.

2011 Notes: This unit was opened to the Lake in the spring and late fall it fluctuated though out the year with lake levels. It was closed to the lake for trapping in late November. No pumping was needed.

Draw Down Years: 2014-summer-winter for construction, 2012-partially in fall due to lower lake levels and drought, 2005 – Pumped down mid-March through end of May with 60% mudflats achieved, remainder 6 in or less. Unable to pump down further. Evapotranspiration led to most of unit drawn down by July. Unit gained water in August and reached May levels again. Unit was reflooded in September. High levels of P.L establishment.



Unit Goals: When possible, provide benefits of a connected coastal marsh ecosystem, including fish access, spawning, and nursery habitat; flood storage; and water quality benefits. Attract a variety of waterfowl, shorebirds, water birds, and wetland animals to provide opportunities for wildlife viewing.

Objectives: Holding pattern until funds available for restoration is known.

Strategies: Unknown. Evaluate options within available funds, 2015 construction anticipated to require continued drawdown. Invasives explosion especially PL likely, aerial spray, and reflood deep as soon as construction completion allows.

Management Strategy Constraints: Siltation at outlet of Radar Ditch prevents water from dropping excessively during low water years or seiche events. On average-high lake level years, unit can be managed as open to Lake Erie for small fish access, after spring carp spawning is completed.

Repairs Needed:

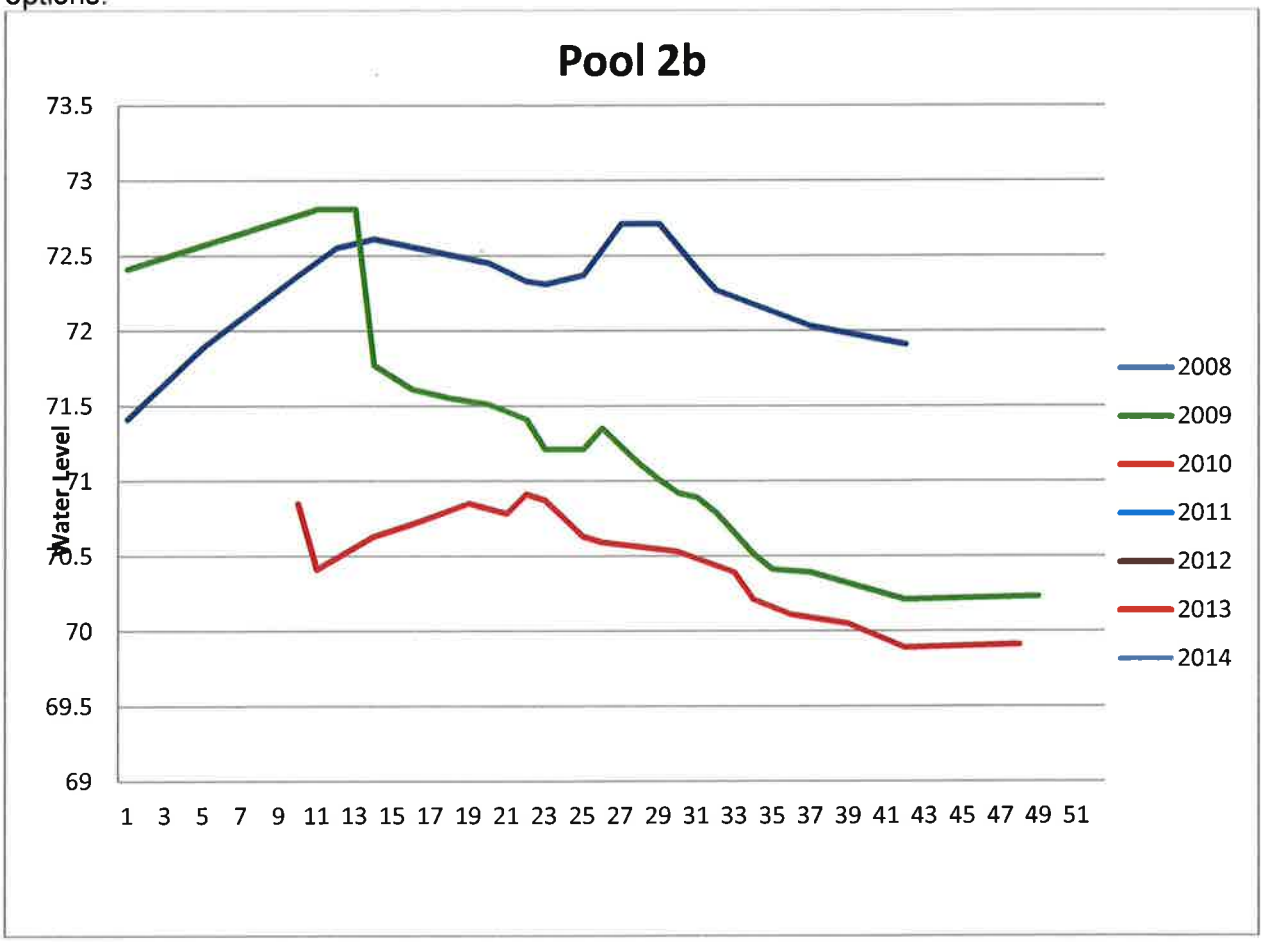
Unit: **Pool 2c** – 72.0 on the gauge = 2 - 2 ½ feet of water across most of unit. CF: 0=69.96

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Holding pattern, evaluate.
			Jan.			
			Feb.			
			Mar.			
2.0	72.0					
			Apr.			
			May			
>1.7			June			
			July			
			Aug.			
			Sept.			
			Oct.			
1.4						
			Nov.			
			Dec.			

Unit: Pool 2B

Acres: 98.3

2011-2014 Activity: 2013 fish passage with stoplog structure installed to Pool 2a. Annually set carp grates before spring carp spawning, then open grates after spawning. Structure is managed as fully open to lake. Staff gauge readings not taken due to automated GOESS system for water levels and water quality. **Draw Down Years:** 2010- for construction of the fish passage. 2009- mid August draw down for fall shorebird migration, fair results achieved; 2006 – Unit was pumped down in mid-March and managed for mudflats & spring shorebird habitat through June. Unit was reflooded in July; 2005 – Pumped down early August for fall shorebird migration. 90% mudlflats achieved by early September. Excellent shorebird response. Low lake levels limited flooding options.



Unit Goals: Provide benefits of a connected coastal marsh ecosystem, including fish access, spawning, and nursery habitat; flood storage; and water quality benefits. Attract a variety of waterfowl, shorebirds, water birds, and wetland animals to provide opportunities for wildlife viewing.

Objectives: Manage as coastal marsh whenever possible, providing fish access and water quality benefits.

Strategies: Leave open to Lake Erie. Set carp exclusion grates as needed based on water temperatures. Monitor for invasive issues.

Management Strategy Constraints: Extreme high lake levels could comprise the Pool2a-2b dike.

Repairs needed: install IGLD staff plate for independent readings.

Unit: **Pool 2b**

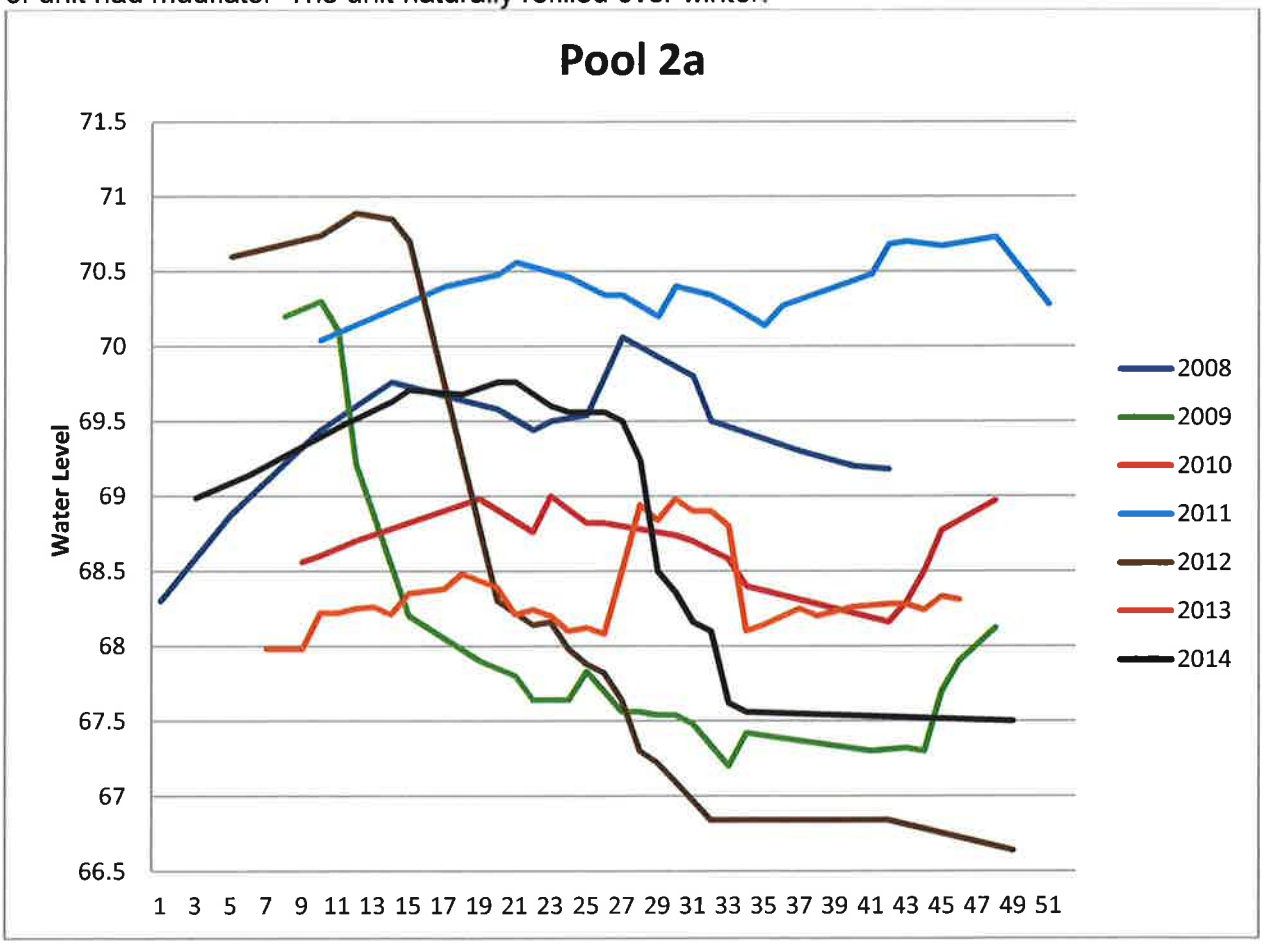
Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Set carp gates as indicated by monitoring.
			Jan.			Manage fully open to Lake Erie.
			Feb.			
			Mar.			
			Apr.			
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

Unit: Pool 2A

Acres: 69.2

2014 Activity: Summer drawdown. Removed failed WCS to MS 8a. Pump installation started late fall and will continue into spring 2015. **2013 Activity:** Unit drawn down for installation of fish passage to Pool 2b, structure 85% completed in September. Stoplogs set to prevent adding water, to set up for 2014 pump installation. Aerial spray invasives/trees. **2012 Activity:** Unit drawn down for planned installation of fish passage structure to Pool 2c. Project cost prevented installation, rebid. 2011 notes: Water was significantly higher this year due to rainfall and high water levels. Tried pumping out in late November but tractor broke down.

Draw Down Years: 2012-2014—for construction Pool 2a-2b fish passage installed 2013, pump installation 2014, with winter recharge annually. 2009 – April through August managed for mudflats & shorebird use, reflooded in November – excellent shorebird use and good response of nutsedge & nodding smartweed around island; 2007 – Pumped down by May and reflooded in July. Missed April shorebird migration, but excellent knodding smartweed, sedge, & millet response and fall duck use. 2004 – drawn down started late March, but it was August before 90% of unit had mudflats. The unit naturally refilled over winter.



Unit Goals: Provide benefits of a connected coastal marsh ecosystem, including fish access, spawning, and nursery habitat; flood storage; and water quality benefits. Attract a variety of waterfowl, water birds, wetland animals and invertebrates to provide opportunities for wildlife viewing.

Objectives: Manage as coastal marsh whenever possible, providing fish access and water quality benefits.

Strategies: Remove stoplogs and maintain open connection to LE hydrology via Pool 2c when pump installation is complete.

Management Strategy Constraints: Awaiting construction completion.

Repairs Needed: Install IGLD staff gauge. CF 0=559.5 needs verified.

- **All gauge reading above 9 need 10 added to gauge reading**

Unit: **Pool 2a** - Majority of mudflats exposed at 7.66

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Open to LE hydrology when pump construction is
			Jan.			finished.
			Feb.			
			Mar.			
9.5-9.7						
			Apr.			
9.2			May			
			June			
			July			
			Aug.			
			Sept.			
9.0-9.2			Oct.			
			Nov.			
			Dec.			

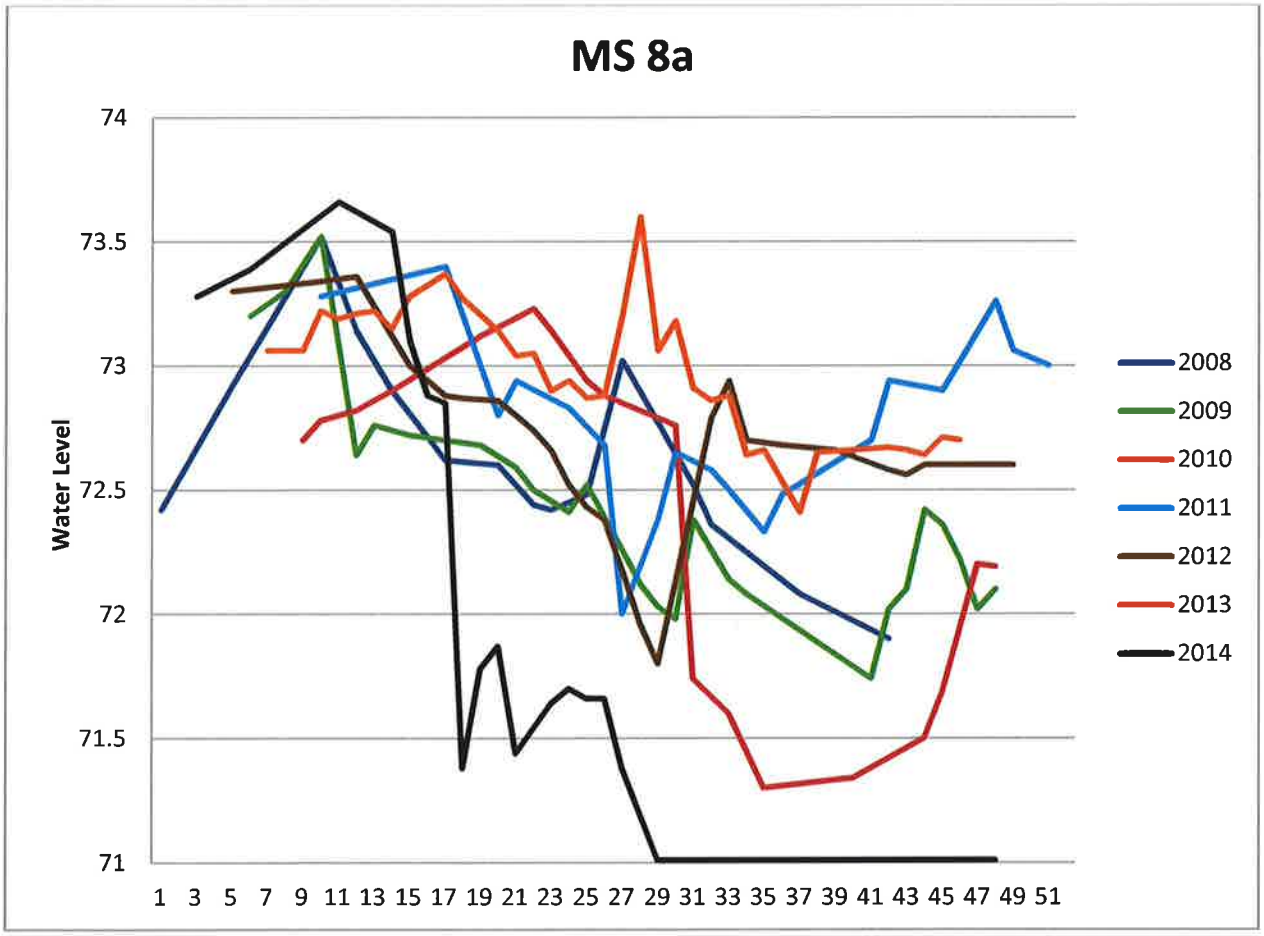
Unit: MSU 8A

Acres: 55.1

2014 Activity: Pump installation started late; should be completed spring 2015. Cattails in higher elevation mowed overwinter. Repaired electric and installed floats to old pump station. **2013 Activity:** Natural hydrological cycle. **2012 Activity:** Maintained levels by pumping as needed, since this was one of the few units with reliable water during the 2012 drought.

2011 notes: Water was high at the beginning of the year in this unit but someone tampered with the structure and opened this unit to 2a which caused the water levels to drop.

Draw Down Years: 2014, construction of pump structure. 2010 –Water taken out of unit in August reflooded in November. 2009 – evapotranspiration resulted in mudflats on east side in August. Periodic pumping and mudflats occurred through mid-October; 2004 – drawn down in March. Parts of unit disked. Reflooded in mid-September; 2003 – planted buckwheat and flooded in fall?



Unit Goal: Provide benefits of a connected coastal marsh ecosystem, including fish access, spawning, and nursery habitat; flood storage; and water quality benefits. Attract a variety of waterfowl, water birds, wetland animals and invertebrates to provide opportunities for wildlife viewing.

Objectives: Manage as coastal marsh whenever possible, providing fish access and water quality benefits.

Strategies: Reflood in spring through free flow and pumping to FSL to discourage invasives and cattails. Evaluate maximum sustainable level with breach, patch if necessary.

Management Strategy Constraints: Beaver lodge present on south side, holes through to MS LL limit maximum pool.

Repairs Needed:

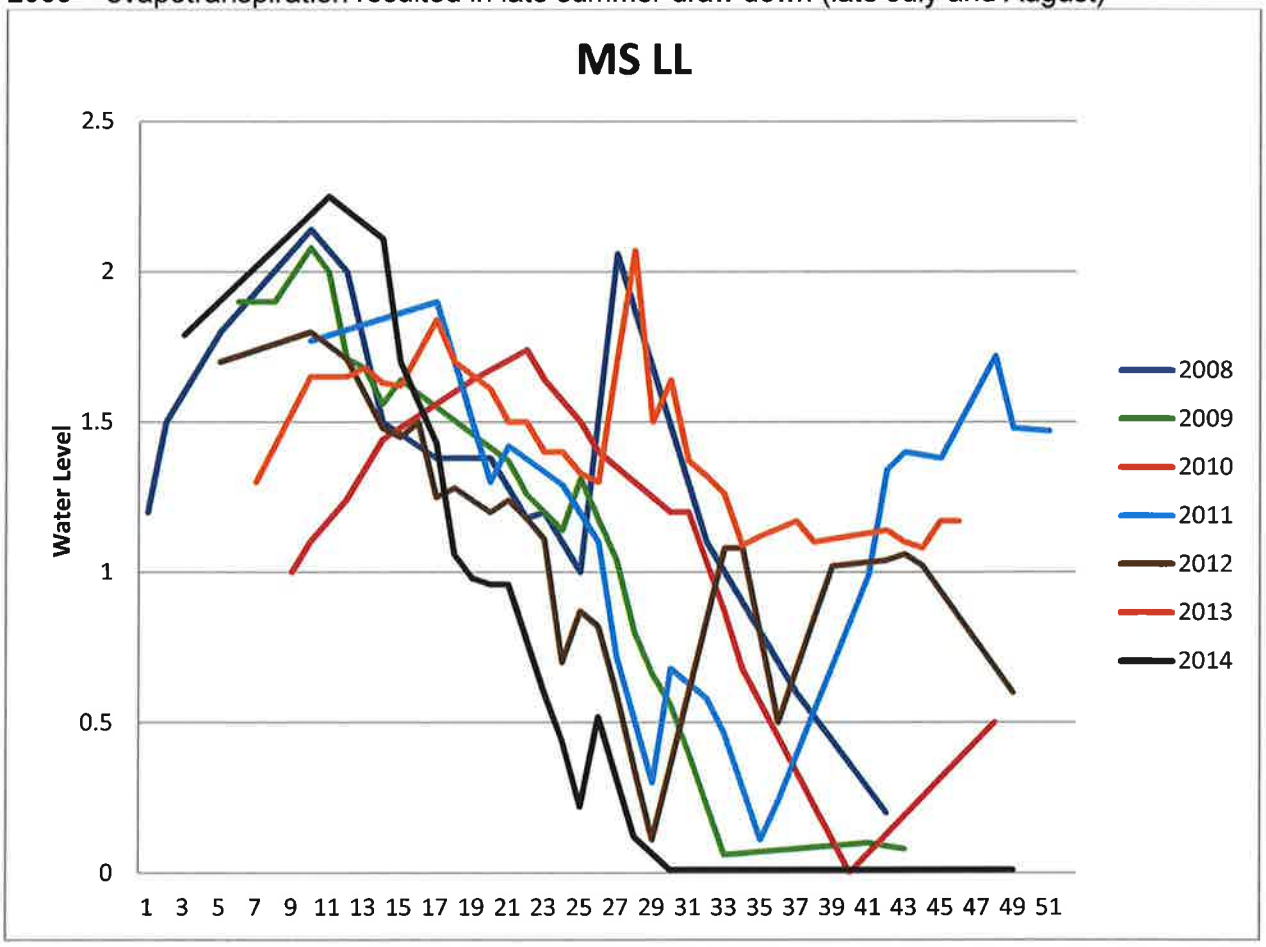
I. South dike is breached to MSLL and woods
II. WCS to Pool 2a can be removed once new pump installation is in place.
III. Redundant screw gate on Pool 2a side has fallen off.

Unit: **MS 8a** Full pool TBD, impacted by south dike failure. CF=71.22

Desired water level			2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Reflood to FSL once construction complete. Evaluate and
			Jan.			monitor dike breach to MS LL and impact on woodlot.
			Feb.			
			Mar.			
			Apr.			
1.7						
			May			
1.5			June			
			July			
			Aug.			
			Sept.			
0.8-1.0			Oct.			
			Nov.			
			Dec.			

Unit: MSU LL

Acres: 20.1, includes high ground that does not flood
2014 Activity: Drawndown in summer due to breach to MS 8a. **2013 Activity:** Natural hydrological cycle. **2012 Activity:** Unit drew down due to drought.
2011 notes: Water levels fluctuated all year because of rain and pumping.
Draw Down Years: 2014-drawdown MS 8a and breach caused to dewater. 2013-breach to MS 8a, 2012-due to drought, 2010- Starting in September water was below boards until December. 2009 – evapotranspiration resulted in late summer draw down (late July and August)



Unit Goal: Maintain unique refuge habitat and native plants. Provide foraging and nesting habitat for migratory birds.

Objectives: Maintain wetland conditions without excess flooding to drive thru woods.

Strategies: Evaluate inputs from MS 8a dike breach, manage in conjunction with MS 8a or patch dike breach.

Management Strategy Constraints: Unit floods easily from rains, resulting in dramatic water level changes. Approximately 1.3 unit floods north woods. periodically plugged outlet pipe to 8a pump box. Beaver activity present. Dike breach limits water management independent of MS 8a.

Repairs Needed:

I. Pipe to WCS is problematic. -current status unknown – works sometimes.
II. Dike breached to MS 8a is a major repair that should be addressed.
III. Install IGLD gauge

Unit: **MS LL** - Possibly, 1.30 is full pool. Higher water backs up into north woods.

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Take off high water to 1.3, will likely drawdown
			Jan.			through breach to MS8a.
			Feb.			
			Mar.			
1.3						
			Apr.			
1.3						
			May			
1.3						
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

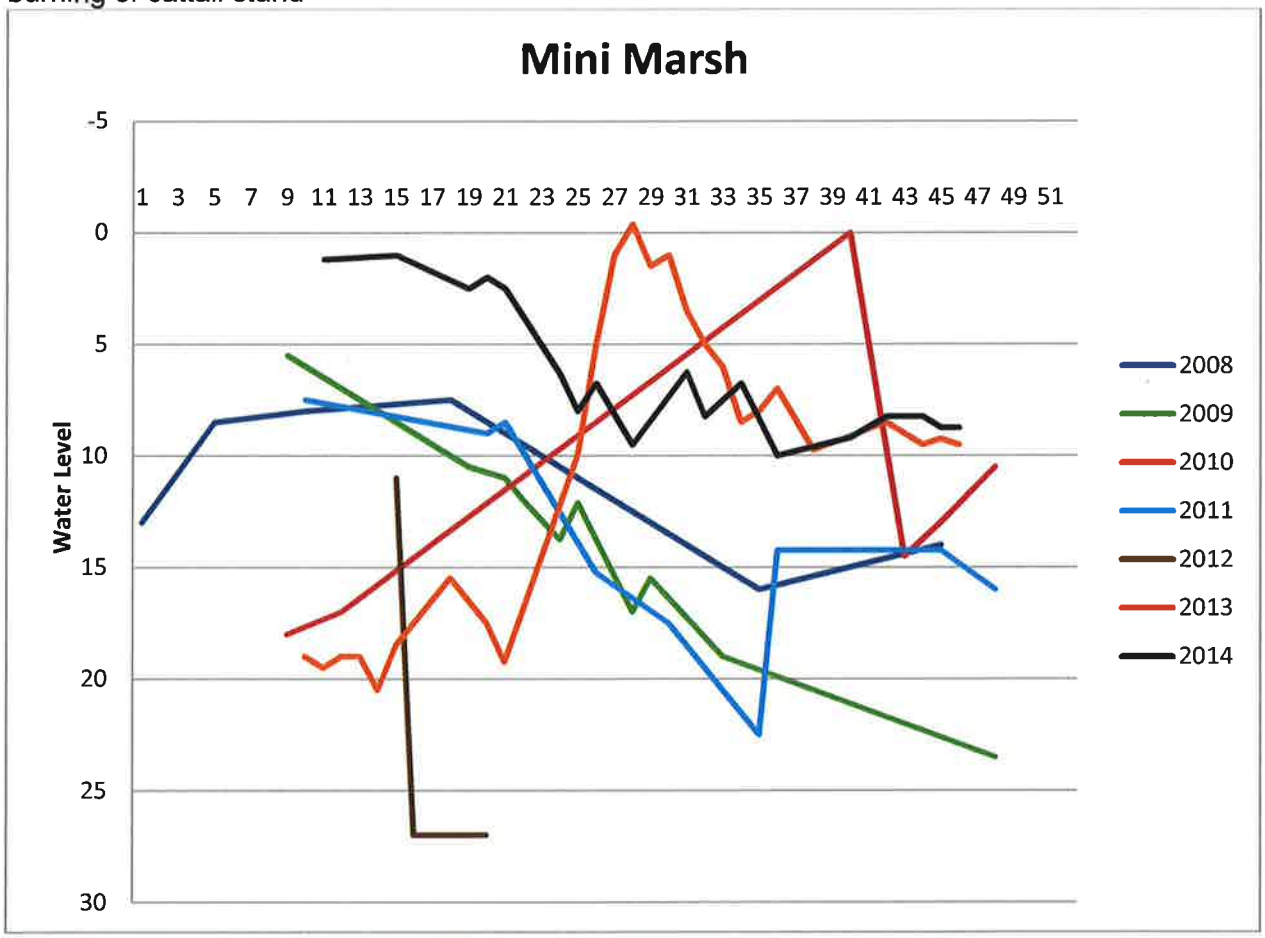
Unit: Mini Marsh

Acres: 16.0

2014 Activity: Maintain near FSL to discourage cattails and encourage muskrats. Installed new flap gate on pump discharge **2013 Activity:** mow in spring, maintain higher water by pumping after. Replaced discharge flap gate. **2012 Activity:** Drawn down in spring for spring shorebirds and for spring prescribed burn of dense cattail stand, summer light disk of cattails. Some cottonwood establishment on east side. Limited shorebird use or vegetation response to drawdown.

2011 notes: Mini marsh is used as a holding tank to pump up blind 93 in the fall. During this time water levels fluctuate highly until pumping is finished.

Draw Down Years: 2013 spring mowing of cattails and reflood. 2012-for spring shorebirds and burning of cattail stand



Note: graph scale is inverted; this is a measure down to water surface.

Unit Goal: Provide resting and foraging habitat for migratory birds.

Objectives: Control cattails, reed canary grass, and cottonwoods.

Strategies: Maintain as high as water as possible throughout year by pumping.

Management Strategy Constraints: Minor leaking back through discharge box at FSL, lack of floats.

Repairs Needed:

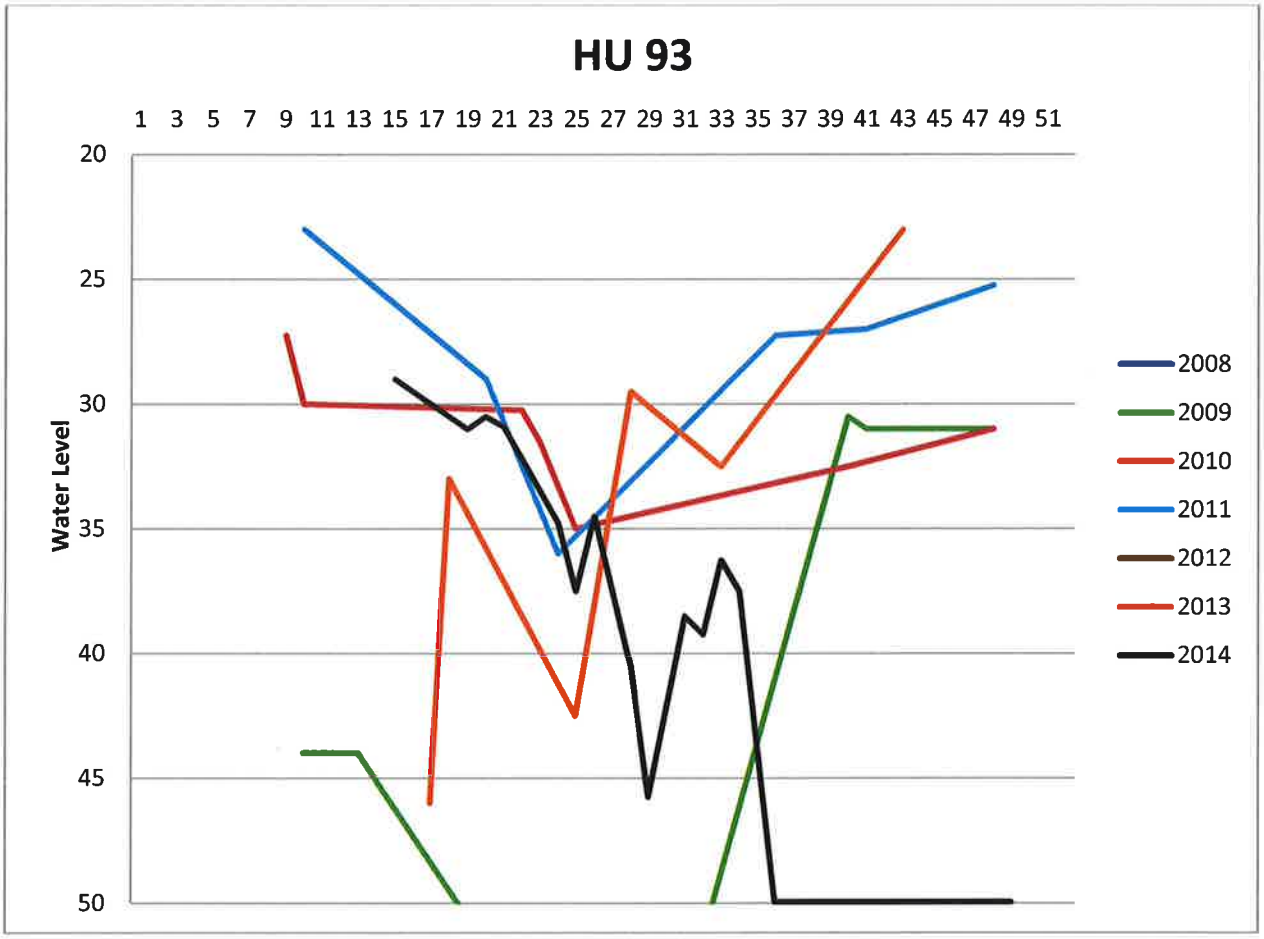
I. Raise south dike – borrow from ditch and inside unit. This would allow for deeper water management capabilities and more diversity.
II. Install IGLD gauge
III. Pump electric service repairs and reinstall floats—mice damage.

Unit: **Mini Marsh -** Measure from waters surface to top of splitter box.

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Maintain high water throughout year by pumping.
			Jan.			Target <8" top of box to water surface.
			Feb.			
			Mar.			
8"						
			Apr.			
8"						
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
10"						
			Dec.			

Unit: Hunt Unit 93

Acres: 19.3
2014 Activity: drawdown naturally by summer. **2013 Activity:** Natural hydrological cycle. **2012 Activity**: Aerial sprayed for phragmites. Complete drawdown all year due to drought.
2011 Notes: Evapotranspiration resulted in mudflats in mid-July. Unit was reflooded in mid-September with a Thompson Pump and was at good water level for hunt season.
Draw Down Years: 2014-natural summer drawdown, 2012-drought, dry all year, 2011- couple dry months before hunt season



Note: graph scale is inverted; this is a measure down to water surface.

Unit Goal: Evaluate for future management during Habitat Management Planning.
Objectives: Evaluate for either spring migration use by shorebirds, rails, and waterfowl; or abandon as marsh unit and allow to reforest.
Strategies: Natural hydrological cycle. Will need to monitor for invasives, and possibly take more aggressive measures in management.
1. Evaluate for moist soil management for shorebirds, if conditions allow disk in fall, allow to flood for 2016 spring shorebird habitat.
2. Remove hunts blinds.

Management Strategy Constraints: This unit sits on high ground and flooding is costly & difficult.
Repairs Needed:

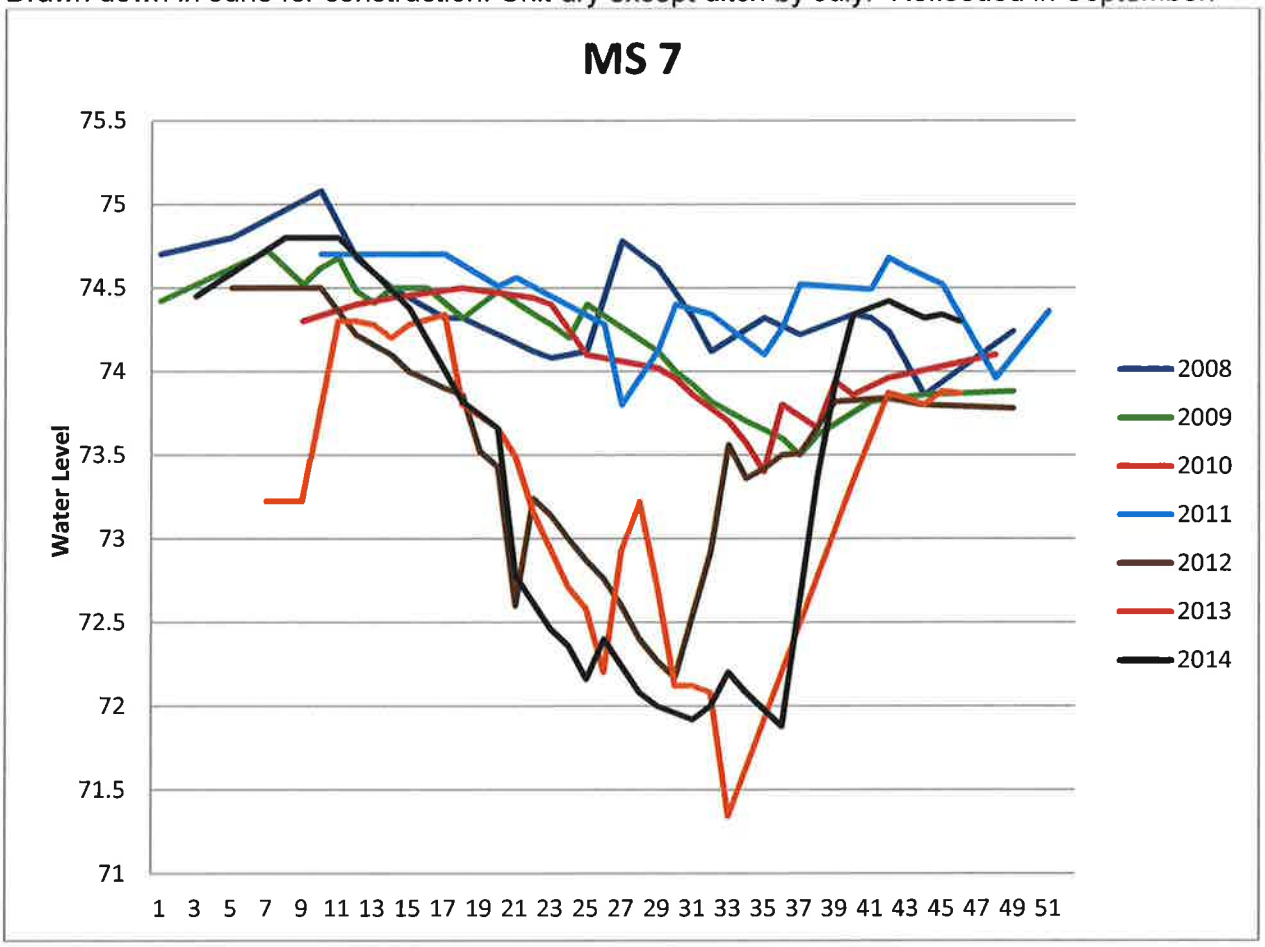
I. If this unit is maintained as a wetland, then the west and south dikes are in questionable shape & may degrade quickly with water against them year round. Consider rebuilding for better compaction, tile search, & higher dike tops.
II. Set staff plate

Unit: **HU 93** - From waters surface to top of brace on screw gate. 32" is full pool ???

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes Dry Out – Treat
old	new			old	new	Check gate closed and boards set overwinter. Natural hydrological cycle. If we can disk, open structure to drawdown in June.
			Jan.			
			Feb.			
			Mar.			
31"						
			Apr.			
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
31"						
31"			Nov.			
			Dec.			

Unit: MSU 7

Acres: 96.7, high ground of about 20 acres with little to no water at full pool.
2014 Activity: slow drawdown in spring for shorebird habitat, disked 2 sections-FR and RCG, south end small broadcast spray. Planted Japanese millet for invasive control in disked areas late summer, fall reflood for hunting. **2013 Activity:** Summer drawdown and heavy disk of RCG and FR areas. Fall flood for hunting. Repaired unit side gate in pump intake. **2012 Activity:** Drawdown in May for spring teal/shorebirds. Smashed opening in flowering rush with marshmaster, with no long term reduction. Openings provided some fall waterfowl use. Had to reflood with portable pumps due to gate failure in pump structure.
Draw Down Years: 2014-spring shorebird, disk/spray, planted japanese millet to test invasive control, fall reflood. 2012/2013—spring shorebirds/teal, 2007 – previous fall draw down resulted in excellent spring bird use. Evapotranspiration led to saturated soils in June. Unit was flooded in late mid-September when pump was replaced; 2006 – A draw down was attempted starting in May, but not achieved until mid-July. Invasives were mowed and disked in early august. Unit was reflooded in mid-August and managed for mudlflats. Unit was reflooded in September; 2005 – Drawn down in June for construction. Unit dry except ditch by July. Reflooded in September.



Unit Goal: Provide migratory bird foraging and resting habitat. In addition the transitional areas on 7B will allow for easily accessible upland habitat for nesting as well as provide a gradient of water levels.
Objectives: Provide teal/shorebird habitat in spring. Continue invasive control.
Strategies: Evaluate 2014 invasive control strategies, based on results, could do shallow drawdown or maintain high water.
Management Strategy Constraints: Discharge pipe may leak.
Repairs Needed:
II. Krause Rd is too low in the SW corner and needs to be raised to allow to manage against invasives with deeper water levels.
III. Discharge pipe is possibly leaking.

Unit: **MS 7**– Full Pool 74.5-75.0, limited by dike SW side. CF: 0=70.82.

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	Evaluate 2014 invasives control results, devise strategy
			Jan.			based upon vegetative response.
			Feb.			
			Mar.			
3.5	74.32					
			Apr.			
3.5	74.32					
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
3.0	73.82					
			Nov.			
			Dec.			

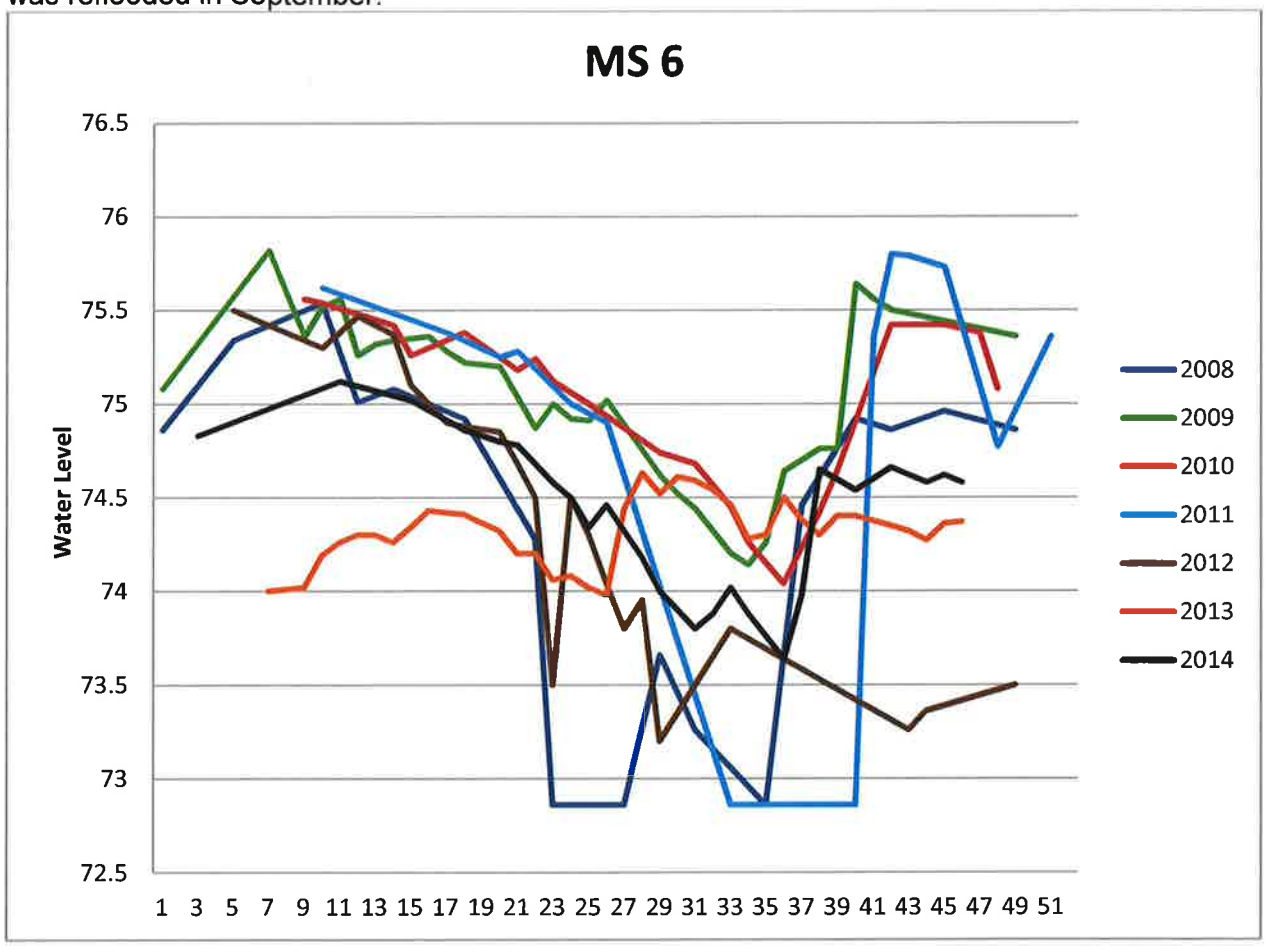
Unit: MS 6

Acres: 61.5

2014 Activity: Maintain moderate pool levels, patch and repair dike holes. **2013 Activity:** A. lotus aerial spray in 2012 reduced coverage. Patched numerous holes, maintained water a lower levels. **2012 Activity:** Unit dewatered in summer for repair of MS pump discharge gates. Test spaying of American lotus by helicopter in fall.

2011 Notes: Water was taken off unit in July for pipe repair and reflooded in October. We used MS6 to also fill HU6 for hunts. A new staff plate was installed in 2009 to reflect true elevations. 2.54 = 75.40. Old plate was torn out in 2011 now must go by new gauge.

Draw Down Years: 2011- for repairs to structure pipe. 2008 – Drawn down for construction in early June. Reflooded in late July and again in September. 2006 – MS pump structure gate for MS6 leaked water out in early spring. Unit was then managed for mudflats and reflooded in Sept.; 2005 – Evapotranspiration led to mudflats in July. A hole in the north dike was repaired. The unit was reflooded in September.



Unit Goal: Provide foraging and resting habitat for migratory birds as well as brood habitat.

Objectives: Manage for hemimarsh conditions.

Strategies: Maintain maximum effective pool given dike condition. Evaluate dike patch ability to maintain water near FSL.

Management Strategy Constraints: see repairs needed

Repairs Needed:

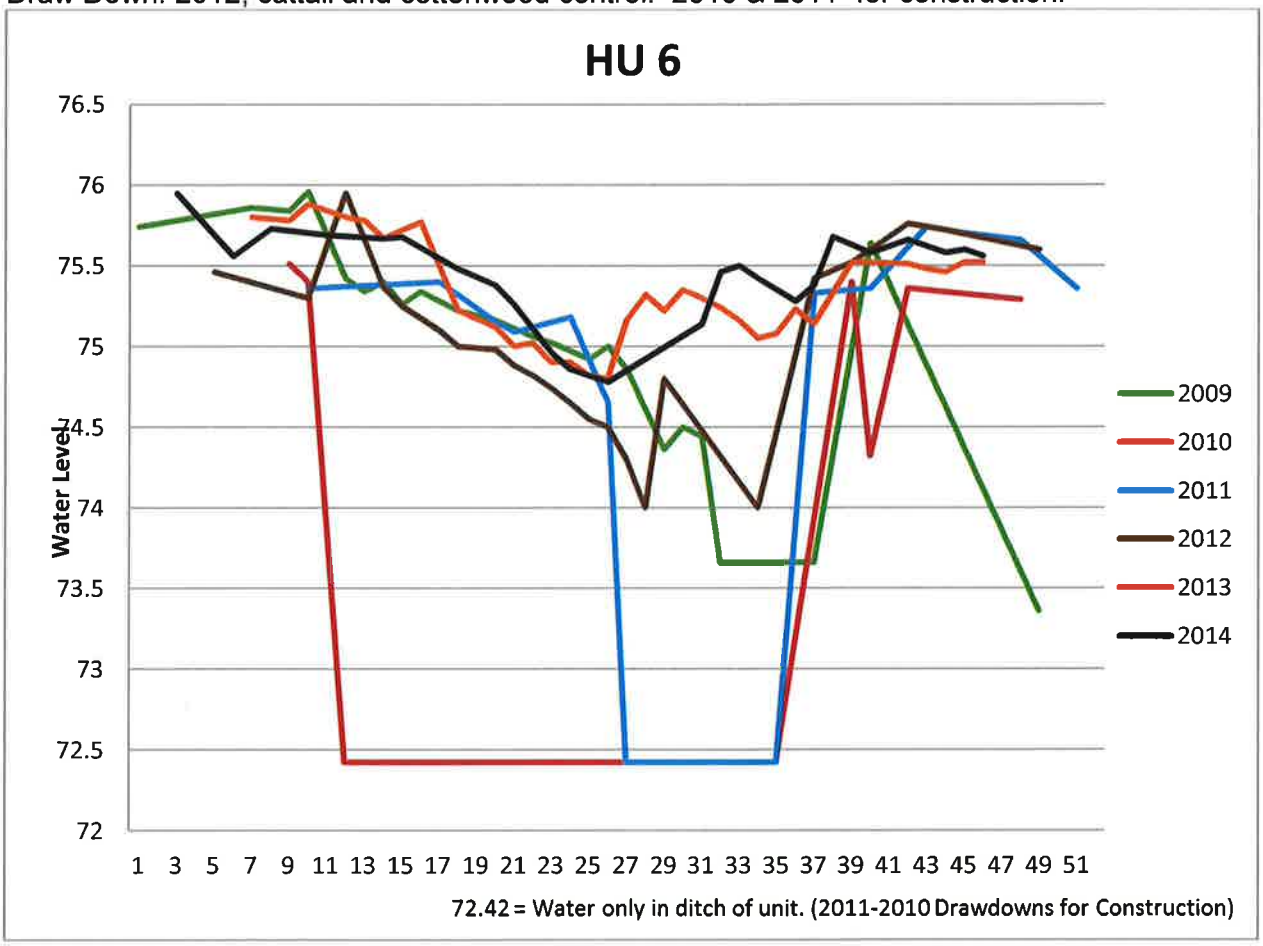
All dikes are in poor shape and need to be rebuilt. Annual patching of muskrat holes is required. Currently periodically partially connected to HU6 by hole through dike.

Unit: **MS 6** Full pool 75.0-75.5 with limited freeboard. Effectively now 74.5-75.0

Desired water level		Wk #	2014 Date	Actual Water level Staff reading	Notes
old	new			new	Evaluate dike patches, maintain water >575 if
			Jan.		dike condition permits.
			Feb.		
2.4	75.26		Mar.		
			Apr.		
			May		
			June		
			July		
1.5	74.36				
			Aug.		
			Sept.		
1.5	74.36				
			Oct.		
					Take high water off before ice up
			Nov.		
			Dec.		

Unit: Hunt Unit 6

Acres: 76.8, small amount of area may not flood.
2014 Activity: Maintained water near FSL for cattail control, smashed openings for hunting. Pumped as needed, with excess water diverted to MS 3, MS4, MS5, and MS 2 south. **2013 Activity:** Natural hydrological cycle, added water by pumping as needed. **2012 Activity:** Summer drawdown, mowed cattails and cottonwoods in about 40% of unit. Fall reflood.
2011 Notes: Mosaic of cattails mowed prior to fall flooding for waterfowl use areas. Opened for shorebird use in April and was completely drawn down in July until September reflooded through MS6 and MS ditch. North and west dikes were rebuilt.
Draw Down: 2012, cattail and cottonwood control. 2010 & 2011- for construction.



Unit Goal: Provide foraging and resting habitat for migratory birds as well as provide a quality hunting area. Evaluate future management. Primary options: marsh or reforestation to riparian habitat/flood plain.

Objectives: Manage for good annual plant production and establishment of some perennial vegetation. Use muskrats and high water to decrease cattails. Spring shorebird habitat in rotation.

Strategies: Maintain near full pool water levels. Evaluate future management direction. Evaluate Crane Creek dike. Evaluate possibility of managing as one unit with MS 6.

Management Strategy Constraints: Common dike with MS6 and dike along County Line road are in poor shape, and limit maximum pool.

Repairs Needed: If maintained as marsh, rebuild of north dike.

Unit: **HU 6** - Full pool 75.40? North dike will breach at WCS at about 76.0. HU 6 is suitable for fall waterfowl when the unit is equalized with MS6 at 75.40 or above.

Desired water level	Wk #	2014 Date	Actual Water level Staff reading	Notes
		Jan.		Maintain water >75.0 for muskrat and flooding
				control of cattails. Evaluate for additional chemical
		Mar.		treatment of cattails.
				- would drawdown, mow,
				refloood if MS6 capacity
				is OK
		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
75.40?		Oct.		

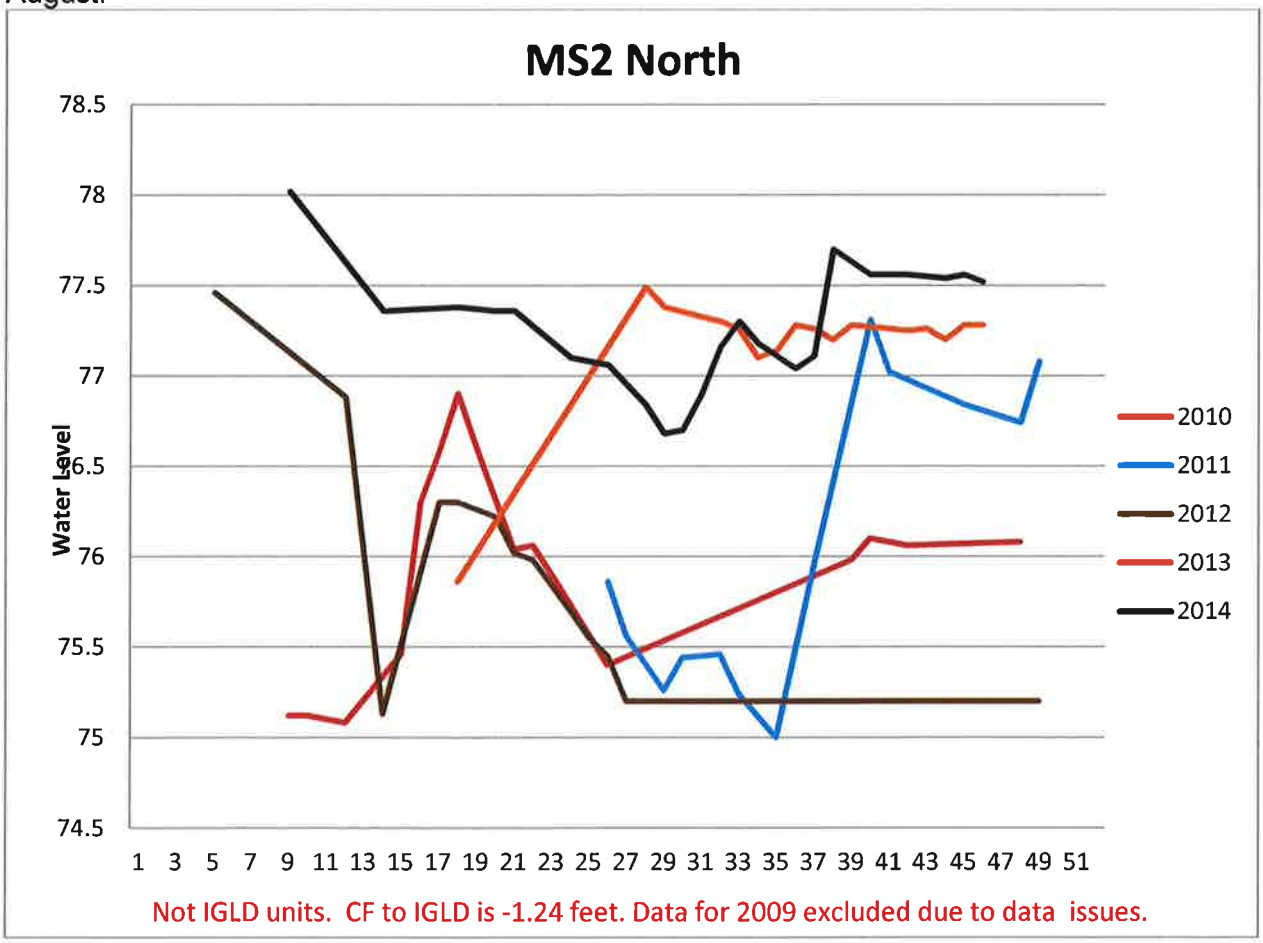
Unit: MS 2 North

Acres: 43.7

2014 Activity: Maintained near FSL to help muskrat population and flood cattatils. Smashed openings for hunts and sprayed some cattails. Small area of wild rice developed from test planting. **2013 Activity:** Spring prescribed burn, spray large RCG areas. Summer flood up. MM smashing of openings for waterfowl hunts. Wild rice seed from CP test planting. **2012 Activity:** Unit drawn down in summer for raising of all unit dikes and patching of muskrat holes. Was not possible to reflood unit in Fall due to low lake level conditions.

2011 Notes: Water was pumped into the unit in end of August through late September. At 77.46 there is water though the whole unit and about a foot of water in the middle. Good trapping depth.

Draw Down Years: 2012-dike repair, 2011-vegetation establishment, 2009 – March through mid-August.



Note: 2009 data is suspect, removed from graph, may be in IGLD?

Unit Goal: Provide foraging and resting habitat for migratory birds as well as provide a quality hunting area.

Objectives: Manage for good annual plant production and establishment of some perennial vegetation. Provide more open water/vegetation interspersion.

Strategies: Maintain high water, evaluate full pool level, and adjust stoplogs to MS2 South if necessary. Monitor for invasive species. Monitor for and encourage spread of Wild Rice through additional smashing and spraying of cattails around population perimeter.

Management Strategy Constraints: Determine new desired full pool. Water leaks through pump structure, make sure gates are closed after pumping. Floats and electrical repairs needed.

Repairs Needed: Gauge is not IGLD, CF to IGLD is -1.24. Repair pump electrical and install floats.

Unit: MS2 North. Full pool 77.5?

Desired water level	Wk #	2014 Date	Actual Water level Staff reading	Notes
		Jan.		Maintain >77.0, pump as needed.
				Close pump gates after pumping due to back leaking.
		Mar.		
76-77		Apr.		
		May		
76.0		June		
		July		
		Aug.		
		Sept.		
77-77.5		Oct.		

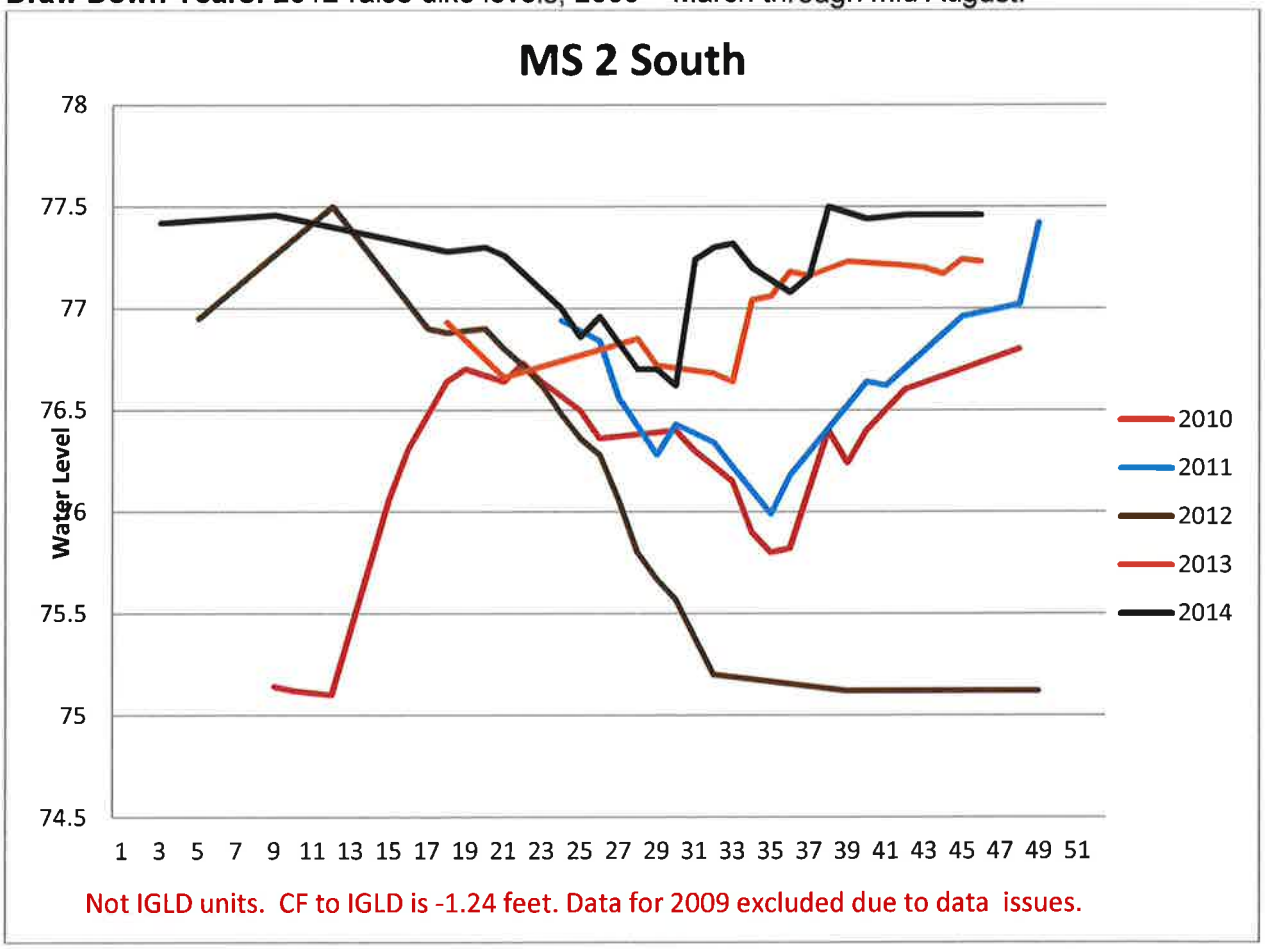
Unit: MS 2 South

Acres: 45.7

2014 Activity: Maintained near FSL to help muskrat population and flood cattatils. Smashed openings for hunts; sprayed some cattails. Small area of wild rice developed from test planting. **2013 Activity:** Spring prescribed burn, spray large RCG areas. Summer flood up. MM smashing of openings for waterfowl hunts. Wild rice seed from CP test planting. **2012 Activity:** Unit drawn down in summer for raising of all unit dikes and patching of muskrat holes. Pump ditch dikes raised, pump repaired, electrical with floats installed. Was not possible to reflood unit in Fall because of pump issues.

2011 Notes: Water level was consistent with 2010 levels. In 2010 we tried to put water in unit though MS ditch but were unable to do so because ditch wasn't high enough. The west half of the unit that is higher had lots of annual grass germination (foxtail, timothy, panic grass) and no real problem species.

Draw Down Years: 2012-raise dike levels, 2009 – March through mid August.



Unit Goal: Provide foraging and resting habitat for migratory birds as well as provide a quality hunting area.

Objectives: Manage for good annual plant production and establishment of some perennial vegetation. Provide more open water/vegetation interspersion

Strategies: Maintain high water, evaluate full pool level, adjust stoplogs to MS2 North and to MS2 pump ditch if necessary. Monitor for invasives. Monitor for and encourage spread of Wild Rice through additional smashing and spraying of cattails around population perimeter.

Management Strategy Constraints: Determine desired full pool.

Repairs Needed: **Gauge is not IGLD, CF to IGLD is -1.24.**

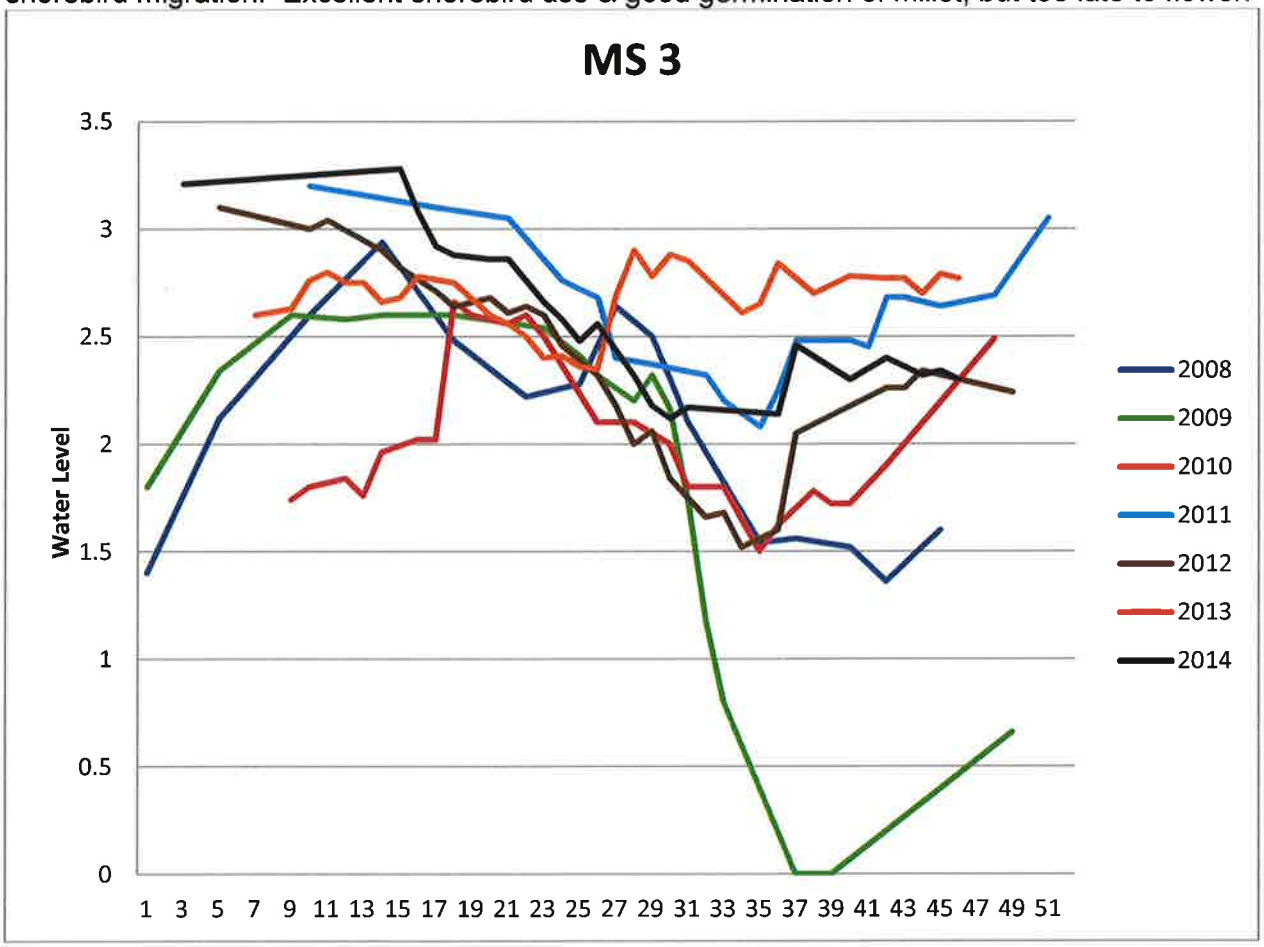
Unit: **MS 2 South**

Desired water level	Wk #	2014 Date	Actual Water level Staff reading	Notes
				Maintain >77.0, pump as needed.
		Mar.		
76.0				
		Apr.		
76.0		May		
		June		
		July		
		Aug.		
		Sept.		
76.9-77		Oct.		
		Nov.		

Unit: MSU 3

Acres: 212.9

2014 Activity: Natural hydrological cycle. Water loss through west dike breaches to rail unit. Added water in fall as a result of adding water to HU 6. **2013 Activity:** Natural hydrological cycle. South dike reslope above water line. **2012 Activity:** Water in unit all year. Drought did cause lower water levels summer-fall. Flowering rush aerial sprayed in fall, south and east side.
2011 Notes: Water was high most of 2011 because ditch was so high all year from MS4 structure being broke and leaking into the ditch. We needed to add one board to the structure in September because water was flowing into the unit from pumping up the ditch.
Draw Down Years: 2009 – drawn down July 13 through October 21 for construction & fall shorebird migration. Excellent shorebird use & good germination of millet, but too late to flower.



Unit Goal: Provide feeding, nesting, and brood rearing habitat for migratory birds.

Objectives: Maintain unit as hemi marsh. Provide emergent and submergent marsh habitat for waterfowl, swans, and rails.

Strategies: Drawdown with timing to coincide with west dike repairs. Potential fall shorebird habitat if timing works.

Management Strategy Constraints: Deteriorating west dike, dike breached to rail unit.

Repairs Needed:

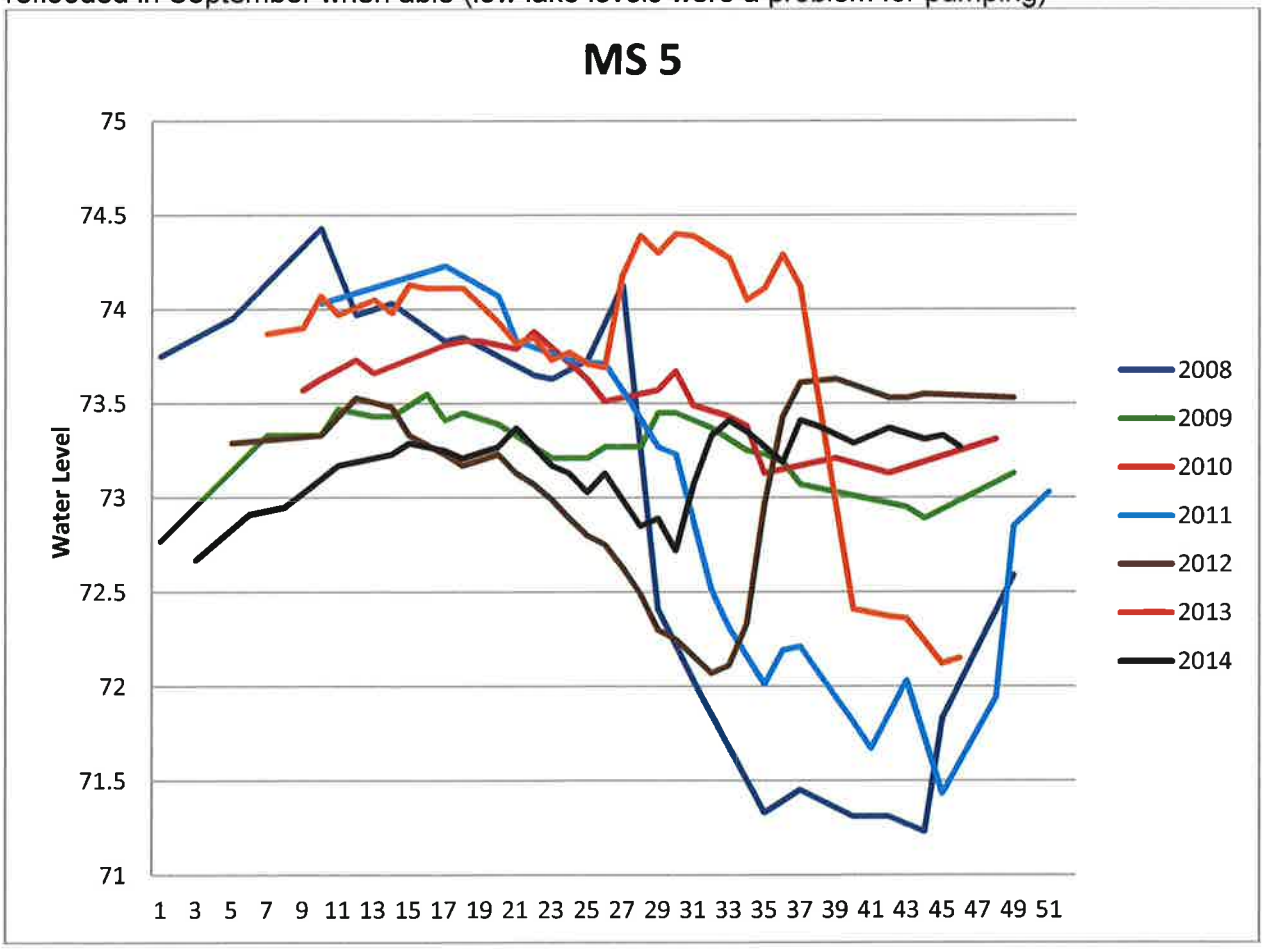
I. West dike rapidly deteriorating, needs major repair
II. Stop logs need additional screws, are installed backwards
III. Set IGLD staff plate

Unit: **MS 3** Full pool about 3.2, maintained by agridrain.

Desired water level		Wk #	2014 Date	Actual Water level Staff reading	Notes
old	new			new	Drawdown with timing for west dike repairs. Try
			Jan.		to coincide will fall shorebird habitat if possible.
			Feb.		
			Mar.		
2.5					
			Apr.		
			May		
			June		
			July		
			Aug.		
			Sept.		
2.3					
			Oct.		
			Nov.		
			Dec.		

Unit: MSU 5

Acres: 247.5
2014 Activity: Natural hydrological cycle, added some water in fall as part of HU 6 pumping.
2013 Activity: Natural hydrological cycle, then fall partial drawdown for shorebird/teal migration. A. Lotus beds reduced by 2012 aerial spraying. **2012 Activity**: Water in unit all year. Added water in August due to excessive water loss during drought. Test plots for aerial spraying of flowering rush and American lotus in fall. Spot treating of purple loosestrife.
2011 Notes: Water was drawn down for shorebird habitat in September and remained low until December. Thompson pump was used in the NE corner of the unit to draw water down to the maximum capacity, lots of good shorebird use in these months.
Draw Down Years: 2013-fall partial drawdown for shorebird habitat. 2011- Draw down in September for shorebird use put water back in the unit in December. 2008 – drawn down in early July and dry on the west side by August 1 for construction on west dike. Excellent shorebird use on eastern half of unit. Reflooded in early November; 2005- Drawn down in mid-March and reflooded in September when able (low lake levels were a problem for pumping)



Unit Goal: Provide a resting and feeding area for migratory birds. West half provide open water loafing habitat, and may maintain open water longer for use during cold winters.
Objectives: Manage for hemi marsh conditions and prevent further establishment of Purple Loosestrife.

Strategies: Maintain FSL. Monitor for purple loosestrife. Consider bur reed augmentation management actions on west side.
Management Strategy Constraints: Limited vegetation changes during drawdowns. Flowering rush becoming established west end. Limit extent of A. Lotus beds by aerial spraying as needed.
Repairs Needed: Set IGLD staff plate

Unit: **MS 5** Full pool 3.0-3.2? CF 0=571.13

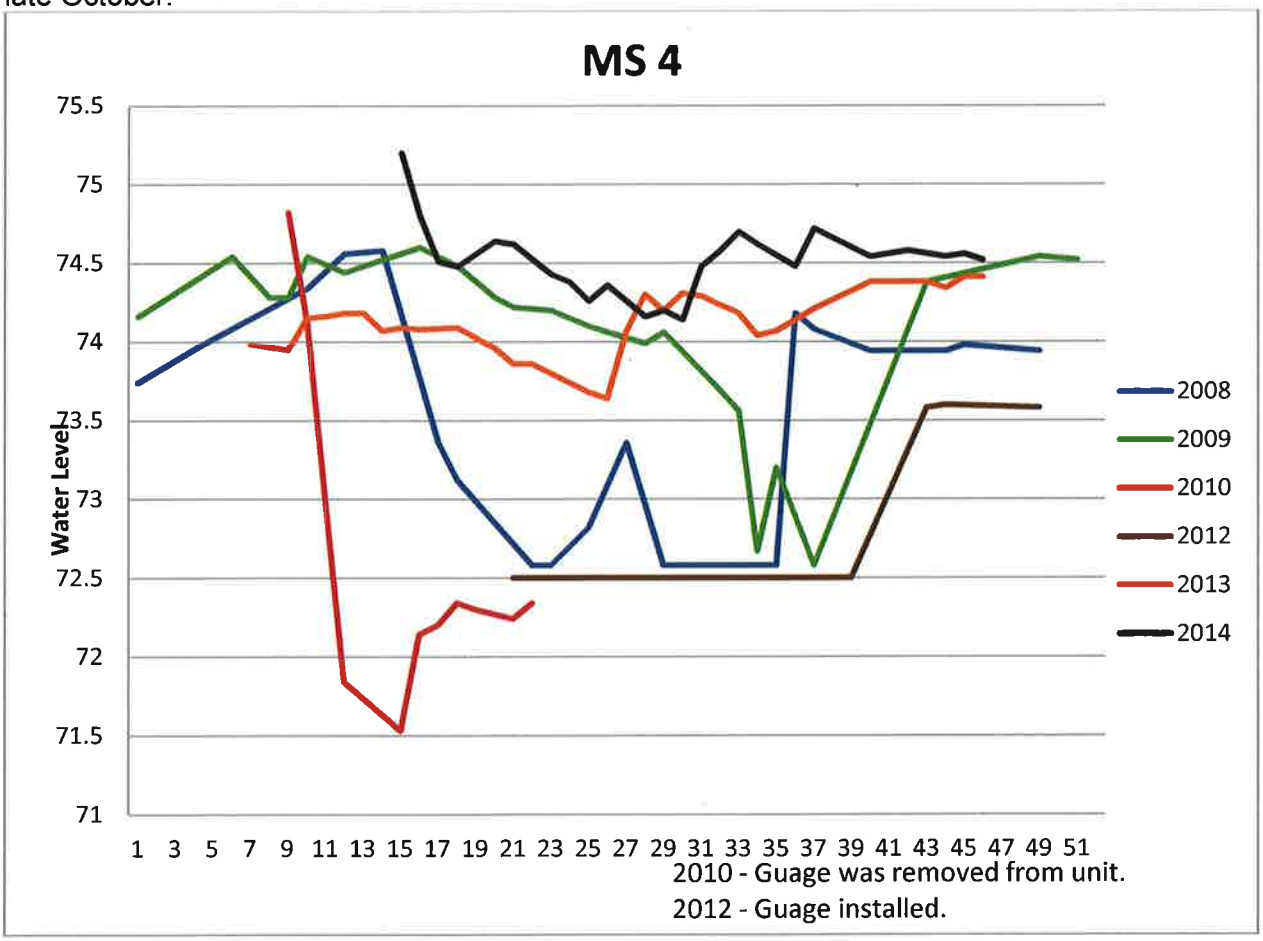
Desired water level		Wk #	2014 Date	Actual Water level Staff reading	Notes
old	new			new	Maintain 573.5 (2.4) water level to keep ~1' water on
			Jan.		west end.
			Feb.		
			Mar.		
2.5-2.7					
			Apr.		
2.5			May		
			June		
			July		
			Aug.		
			Sept.		
2.0-2.2			Oct.		
			Nov.		
			Dec.		

Unit: MSU 4

Acres: 104.0

2014 Activity: High water levels maintained throughout year. Some smashing/spraying of cattails to encourage developing bur reed stands. **2013 Activity:** Maintain high water, spray RCG areas. **2012 Activity:** Drawn down to attempt repairs on agridrain, and to reslope south dike. Openings mowed in cattails, and phrag patches mowed. Staff plate set in October, no readings in 2012. 2011 notes: The water control structure has replaced in 2010 but blew out in August while trying to fix a leak. Structure will need replaced this upcoming year and staff gauge will need replaced. Extensive amounts of flowering rush and Phrag in this unit.

Draw Down Years: 2012-structure repairs and south dike resloping, 2009 – leaking structure resulted in a draw down in July through late October. 2008 – Vandalism of the NE screw/flap gate drew water levels down in early April. The unit was then managed for spring shorebird habitat, and reflooded in early September. Excellent shorebird use and millet germination. 2007 – Evapotranspiration resulted in a partial drawdown in July and again in September through November. 2004 – Drawn down in April for shorebirds and to encourage aquatic veg, reflooded in late October.



Unit Goal: Provide feeding, nesting and brood rearing habitat for migratory birds.

Objectives: Recover and maintain hemi marsh conditions

Strategies: Evaluate vegetation density/interspersion, and maintain high water throughout year to reduce heavy emergent vegetation if still necessary. Spray RCG/Phrag as needed. Evaluate issues with agridrain leaking.

Management Strategy Constraints: Invasive species are an issue, and possibly compromised agridrain structure. Need to maintain full pool for a least a couple of years. If agridrain is failing, need to maintain full water in MS ditch, which limits management of other units. May need additional top section on staff plate, as it can go below water surface.

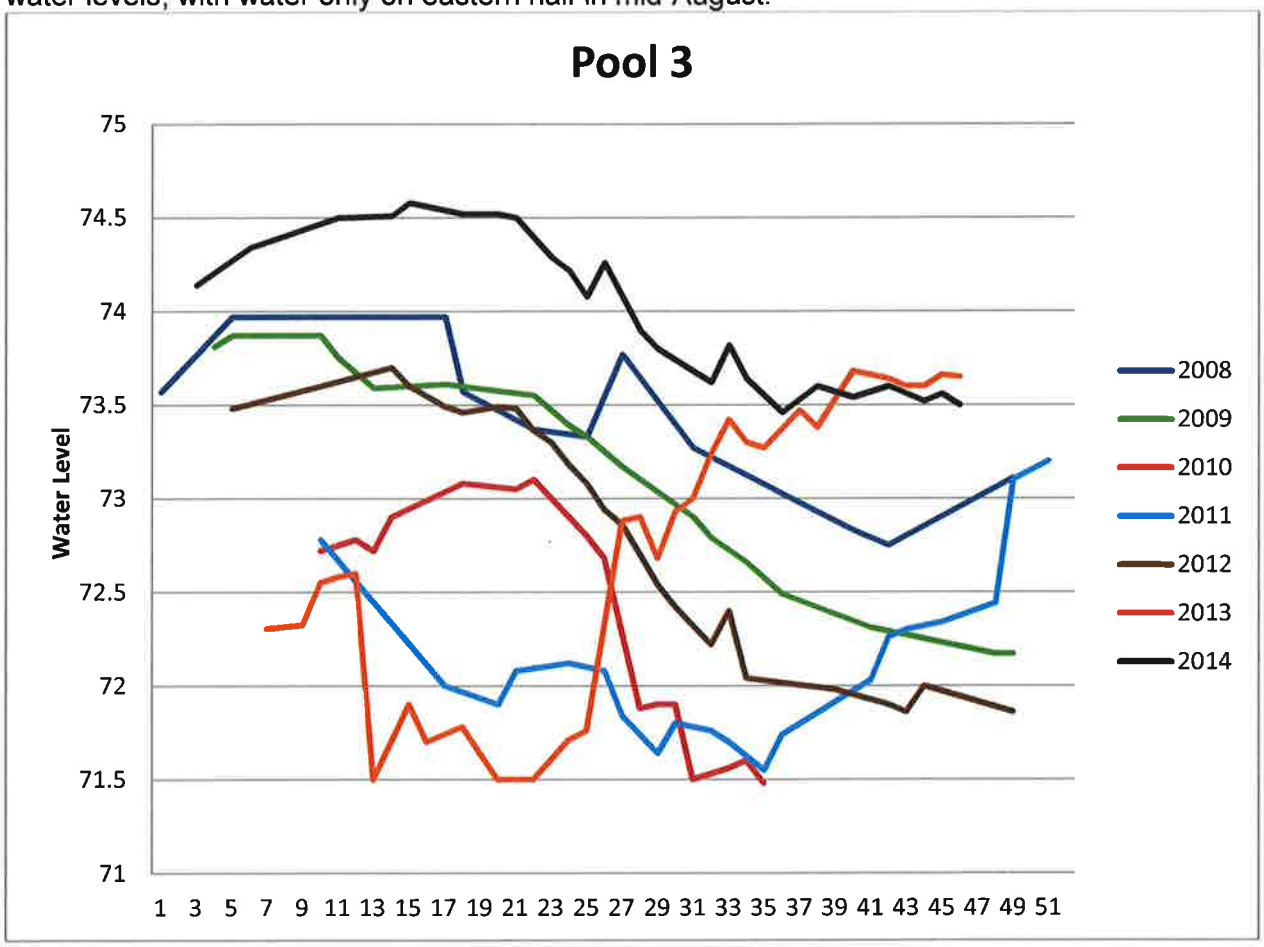
Repairs Needed: Evaluate functioning of agridrain. It appears to still be leaking with reinforced boards. May need to remove and reinstall/replace in correct orientation.

Unit: **MS 4** 72.88- water only in ditch and low areas on north side. 73.98 required to have water across whole unit (2" on high ground of west side). Full Pool TBD.

Desired water level		2014 Date	Actual Water level Staff reading	Notes
				Maintain high water >74.0-74.5 throughout year by pumping
		Jan.		and MS ditch management if needed.
		Feb.		
		Mar.		
		Apr.		
		May		
75.0		June		
		July		
		Aug.		
		Sept.		
74.38		Oct.		
		Nov.		
		Dec.		

Unit: Pool 3

Acres: 228.6, some high ground will remain.
2014 Activity: Natural hydrological cycle maintained desired high water levels without need for pumping. **2013 Activity:** Burned unit in spring. Mowed cattail regrowth in June on west end. Reflooded to full pool. MM smashed opening in fall on west end. Shorebirds and teal used smashed areas extensively. **2012 Activity**: Unit dewatered over the year due to drought, lake levels too low to add water. Planned fall burn did not occur.
2011 notes: Tried to keep water lower in this unit for possible burn this year but because of rain and high lake levels it was hard to keep unit dry. **Draw Down Years:** 2013 spring burn, 2012-drought, 2010 – Drawdown from October till current. 2009 – Evapotranspiration resulted in low water levels, with water only on eastern half in mid-August.



Unit Goals: The primary objective of this unit is to provide food resources and resting cover for migratory waterfowl, waterbirds, nesting Bald Eagles and other wetland dependent species. In addition water levels are managed to encourage native wetland plant communities and discourage exotic invasive species.

Objectives: Manage for hemi marsh conditions west and middle, open water on east for swan and diver use.

Strategies: Set structure to capture water. Maintain high water by portable pump if needed. Monitor for invasive start due to repeated drawdowns.

Management Strategy Constraints: Lack of water supply during below average lake levels.
Repairs Needed: Possibly need to replace pipe in structure, holes are developing.

Unit: **Pool 3** – Full Pool >74.0, maximum ~74.6 CF: 0=70.57

Desired water level	Wk #	2014 Date	Actual Water level Staff reading	Notes
				Maintain water >73.5-74.0 by portable pump as needed.
		Jan.		
		Feb.		
		Mar.		
73.87 -				
74.17		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		
72.67				
		Nov.		
72.67				
		Dec.		

Unit: Metzger Marsh

Acres: 182.5 Refuge portion, includes high ground north of Pool 3/Pool 9 east dike.
2014 Activity: State contract to dredge out 4' of sand build up in intake, natural hydrological cycle.
2013 Activity: Natural hydrological cycle. Drawdown needed, but pump intake silted in. **2012 Activity:** Marsh maintained water during year. Pumped when possible in fall, limited by silting in of intake. Abandoned electric line due to repeated failure. DOW rented generator and adapted power supply to run into existing electric in building. N/A for 2010 /2011
Draw Down Years: 2007 – Drawn down by mid-May and reflooded in September; 2004 – Drawn down mid-May and reflooded early August.

No Chart, inadequate and inconsistent monitoring (measure down vs gauge reading).

Unit Goal: Manage in conjunction with ODOW. Refuge 1/3 of marsh is mostly deeper water. Manage water levels for optimum wildlife use on state side. During suitable Lake Erie water level years, encourage opening of structure to lake for fish passage and water quality benefits.

Objectives: Manage water levels for optimum wildlife use on state side. Primary considerations are to provide quality recreational use, especially fishing and waterfowl hunting. Refuge portion of marsh is primarily suitable for fishing, with some waterfowl hunting opportunities on south and west portions.

Strategies: Planned spring 2015 drawdown of unit. Should provide significant shorebird habitat.

Management Strategy Constraints: DOW waterfowl hunt needs. Entire area is open to the public for recreational use. Intake to structure cleared of 4' silt buildup in 2014, will need to be open to flush out. Gauge fell off in 2014. Electrical service compromised, requires rental of industrial generator to run pump.

Repairs Needed: Install IGLD staff gauge.

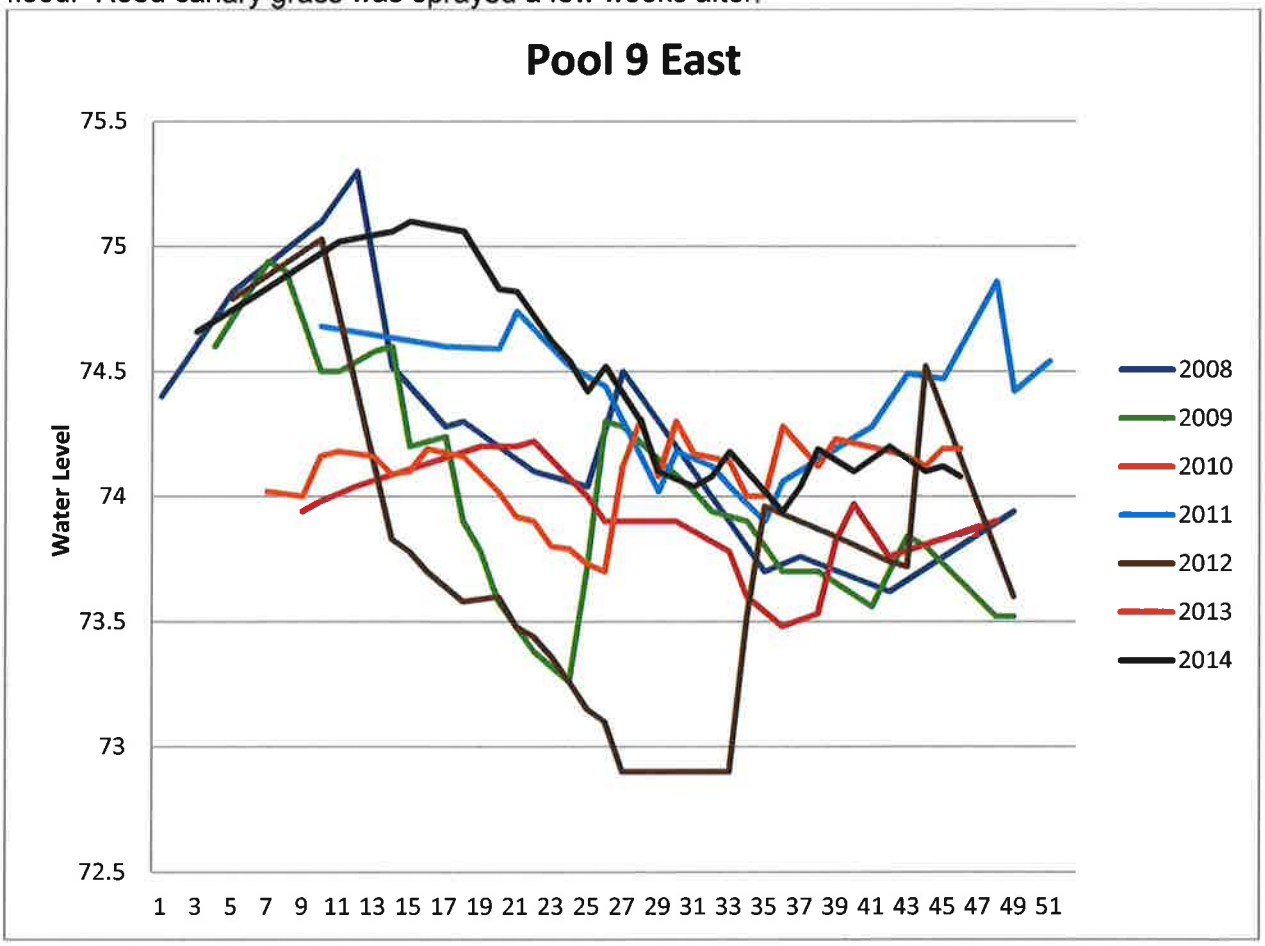
Note: Gauge on outside of pump structure 3 full pool – 24" avg, 6" on back, 7'+Deep

Unit: **Metzger Marsh -** Measure from waters surface to top of eastern lower platform on unit side, at SE corner of concrete. Take gauge reading—CF:0=569.02.

Desired water level		Wk #	2014 Date	Actual Water level Staff reading		Notes
old	new			old	new	
			Jan.			
			Feb.			
			Mar.			
50"						
			Apr.			
			May			
			June			
			July			
			Aug.			
			Sept.			
			Oct.			
			Nov.			
			Dec.			

Unit: Pool 9 East

Acres: 83.2, include small area not flooded, mainly remnant dike.
2014 Activity: Natural hydrological cycle, limited fall pumping for waterfowl hunts. Water levels led to 0.5' on much of unit at low point, good waterfowl use. **2013:** Natural hydrological cycle. Aerial spray of FR. **2012 Activity**: Unit dewatered due to drought. Flowering rush mowed in south and east portion of unit. Reflooded in August with Thompson pumps. Good spring and fall waterfowl use.
2011 notes: No water was pumped in or out of this unit through 2009. Water levels fluctuated slightly but I think 75.3 is too high for this unit in April. A new staff plate was installed. 1.32=73.62.
Draw Down Years: 2012-drought, 2009 – drawn down for 1 month (mid may through mid June) for construction. Reflooded in June. Evapotranspiration resulted in low water levels and small areas of mudflats through the fall; 2006 – March draw down for April burn. Reflooded in April after burn with portable pumps. Flooding took longer than expected and unit greened up before flood. Reed canary grass was sprayed a few weeks after.



Unit Goals Provide resting and foraging habitat for migratory birds, particularly waterfowl migration and wading bird foraging.

Objectives: Eventually target more invasive free, hemi marsh conditions.

Strategies: Maintain full pool if possible. Bur reed beginning to colonize, ensure management activities do not injury population. Evaluate full pool level.
Management Strategy Constraints: Invasive species are a major issue, especially RCG on west side, and flowering rush on east side. In spite of this, continues to see good use during spring and fall waterfowl migration, especially in the flowering rush areas.

Repairs Needed:

Unit: **Pool 9 east -** 73.6 = 2" or less over most of unit (excluding borrow area). Full pool 75.0?

Desired water level	Wk #	2014 Date	Actual Water level Staff reading	Notes
				Maintain >574.5 by pumping if possible.
		Jan.		- shallow spring, deeper fall
				- full drawdown
		Feb.		- keep May, 2016 drawdown
				- look at Bathymetry
		Mar.		
74.8?		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
>73.6		Oct.		
74.0?				
		Nov.		
		Dec.		

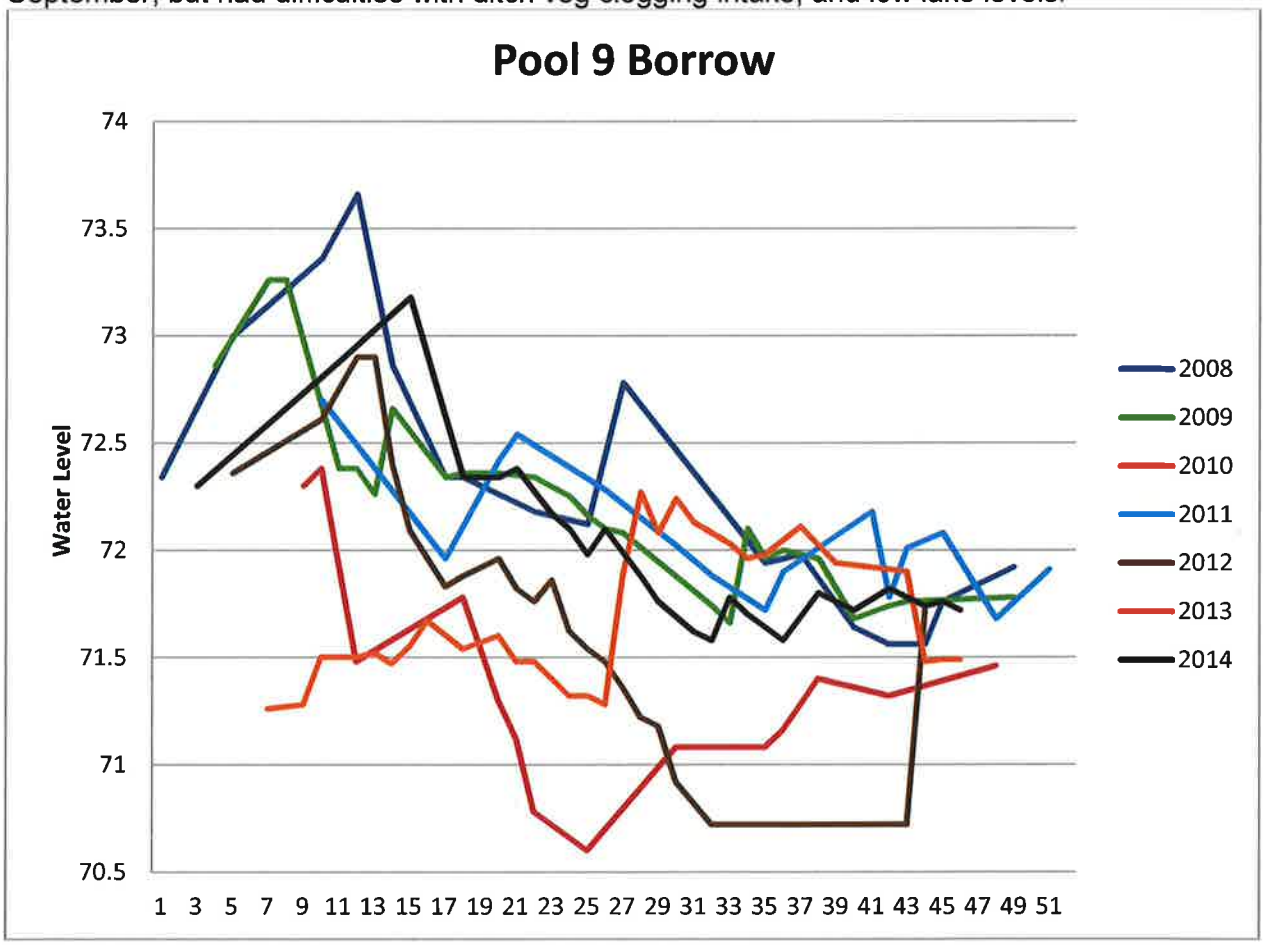
Unit: Pool 9 borrow area

Acres: 42.2

2014 Activity: Spring burn of adjacent grassland produced positive result for bluejoint stands. Y valve installed for 2 way pumping, natural hydrological cycle. **2013 Activity:** Natural hydrological cycle, free flow high water out in fall until reached lake level. **2012 Activity:** Water levels dropped below gauge late summer due to drought, but deeper elevations still had water. Pump broken and needs to be repaired. Continue good waterfowl use in unit, vegetation is good, particularly east side.

2011 notes: Great waterfowl use in March thousands of ducks used this unit. Pumped some water out in November to get levels closer to lake level. A new staff plate was installed, 1.62=71.88.

Draw Down Years: 2012-late summer partially due to drought. 2010 – great annual plant response. 2005 – Unit was dewatered by mid-May. Good veg response. Unit was reflooded in September, but had difficulties with ditch veg clogging intake, and low lake levels.



Unit Goals: Provide habitat for waterfowl, wading birds, and shorebirds. Provide public use waterfowl hunting opportunities.

Objectives: Obtain 19 acres of deep to shallow submergent vegetation and 19 acres of deep to shallow emergent vegetation. Control Eurasian watermilfoil. Maintain 3 waterfowl blinds for hunting program.

Strategies: Open lake level management if conditions permit after carp spawning. Evaluate desired optimal pool level.

Management Strategy Constraints: Evaluate new pump design

Repairs Needed:

I. **Finish pump reconnections**

Unit: **Pool 9 borrow area** Full pool flexible, evaluate desired level.

Desired water level	Wk #	2014 Date	Actual Water level Staff reading	Notes
				Open to lake level hydrology if conditions permit.
		Jan.		
		Feb.		
		Mar.		
71.96(1.7)				
		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		
71.06				
		Nov.		
		Dec.		

Unit: Darby Pump Operations & Pump Ditch settings

Week #	Desired water level	2014 Date	Actual Water level Staff reading	Notes
		Jan.		
		Mar.		
		Apr.		
		May		
		June		
		July		
		Aug.		Pump as requested by landowners
		Sept.		
		Oct.		
				Open ditch to lake before ice up.

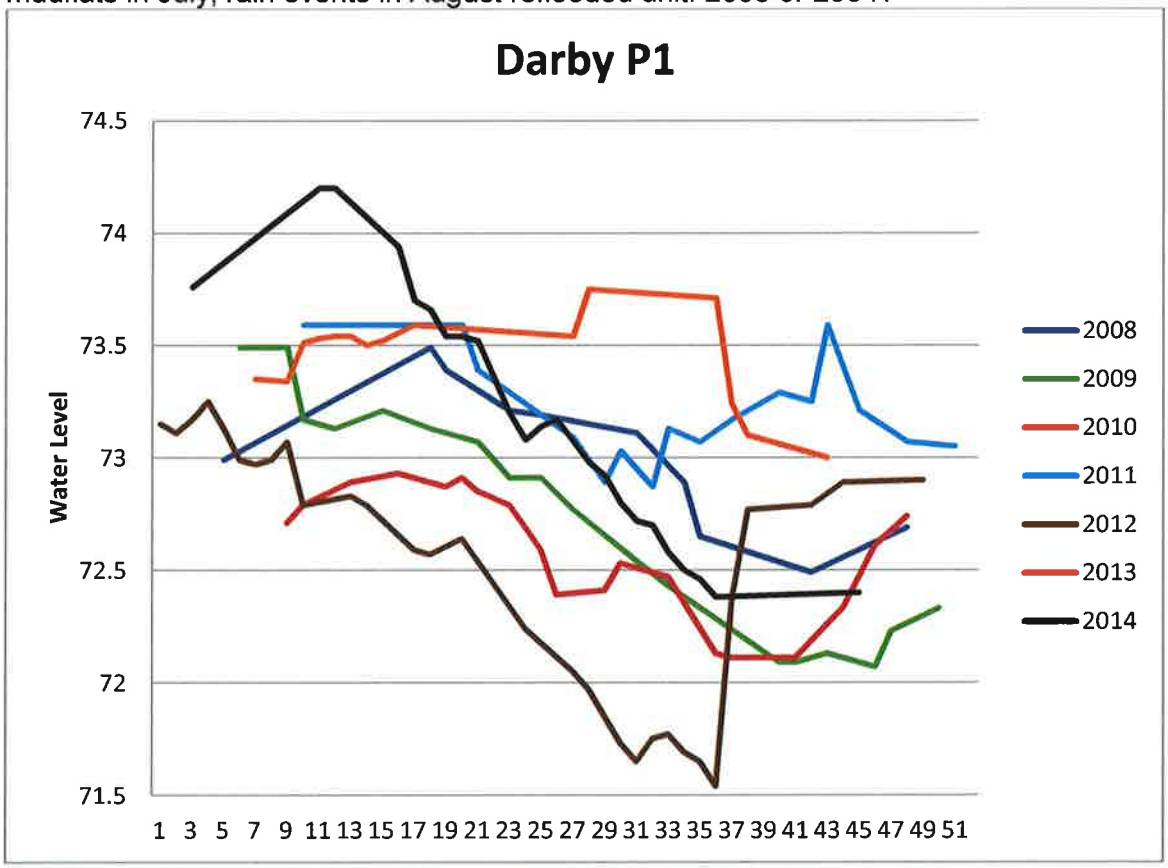
Unit: Darby Pool 1

Acres: 184.7

2014 Activity: Pump electric service repaired, new floats installed. Sediment build up blocked WCS all year, and was cleared out in fall. West WCS to ditch was used, flap gate on ditch side will not seat fully due to bottom sediments. **2013 Activity:** Limited water removal late summer of excess water, WCS to ditch silted in and stopped flowing. Electric service to pump blown out. **2012 Activity:** Partial drawdown due to drought conditions, with mudflats in shallow locations. About a dozen wild rice plants observed in NW corner, first time this species has been observed.

2011 notes: Water was consistently high this year was hard to move water out because of high lake levels.

Draw Down Years: 2012-partial due to drought, 2007 – gauge moved over winter resulting in inaccurate water levels goals, so low water & evapotranspiration led to mudflats in July, rain events in August reflooded unit. 2003 or 2004?



NOTE: recorded water levels may not reflect unit conditions due to isolation

Unit Goal: Provide resting and foraging habitat for migratory birds.

Objectives: Provide a hemi marsh rich in invertebrates and decrease P. Loosestrife infestations.

Strategies: Manage within limitations posed by WCS. Maintain water above moderate pool level of 573 to hinder invasives. Evaluate for aerial spraying of purple loosestrife.

Management Strategy Constraints: Purple loosestrife a significant factor, spreads during any drawdown. Dewatering ability limited due to sediment buildup in unit, isolating WCS from the unit. West WCS to LaCarpe Creek is usable, but sediment in ditch side restricts flap gate closing. Common dike with Pool 4 significantly deteriorated and hole could develop at any time.

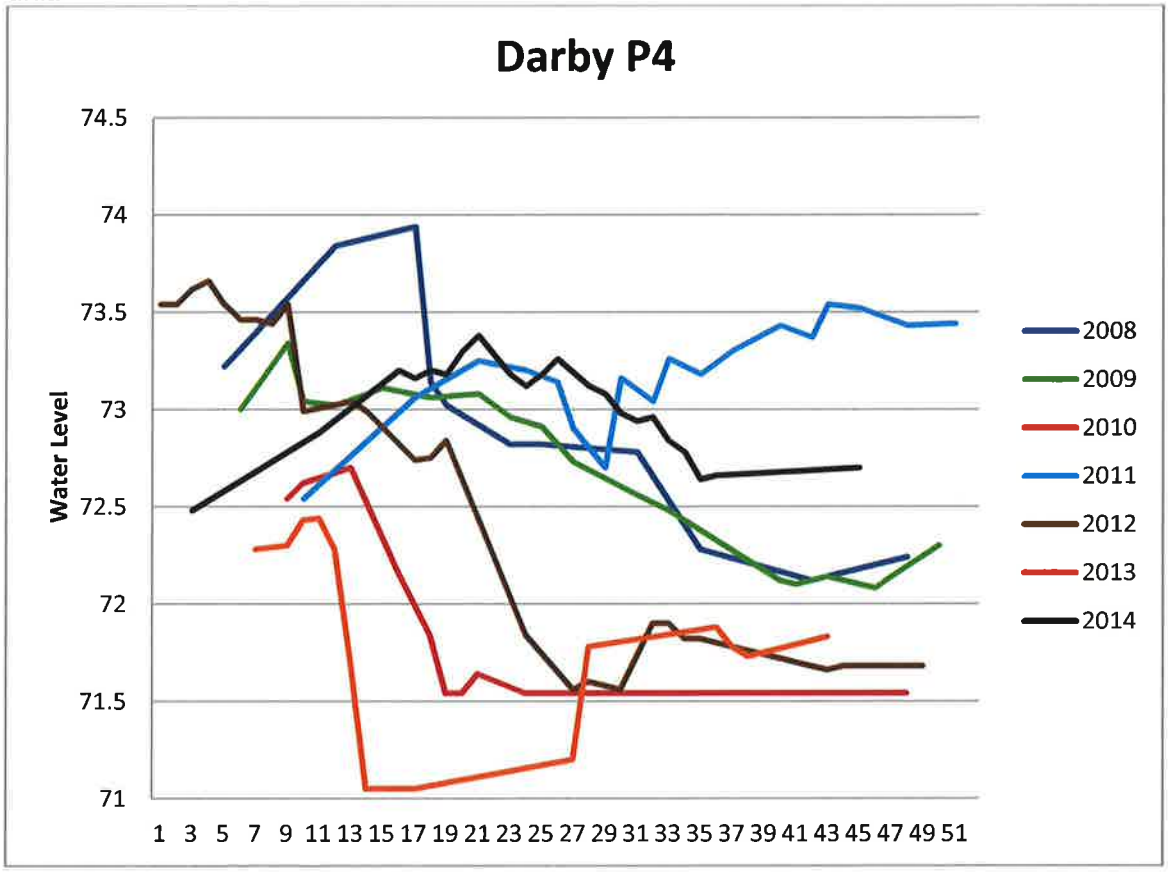
Repairs Needed: 1) Rebuild common dike with Pool 4. 2) Restore full connectivity between unit and WCS by dredging 3) Further evaluate west WCS 4) Determine valid range of water level gauge that reflects unit conditions.

Unit: **Darby Pool 1** Full Pool ~573.8??
Significant amount of mudflats exposed at 571.7. **Add 510 to gauge reading.**

Week #	Desired water level	2014 Date	Actual Water level Staff reading	Notes
		Jan.		Maintain water levels above 573.
		Mar.		
		Apr.		
		May		
		June		
		July		
		Aug.		
	72.4-	Sept.		
	72.6			
		Oct.		

Unit: Darby Pool 4

Acres: 167.5, includes higher ground at south end that only floods at very high levels, and borrow pit acres.
2013 Activity: Spring drawdown for shorebirds and vegetation establishment. Midsummer rain started to refill, and limited funds resulted in no more pumping. **2012 Activity:** Partial drawdown due to drought. 571.8 may be good target for fall migration.
2011 notes: Water was drawn down in 2010 which led to good vegetation and bird use. This year unit was also consistently high because of high lake levels.
Draw Down Years: 2013 spring shorebird and vegetation; 2012 partial due to drought, 2010 – From May till September very good vegetation. Thousands of ducks used this unit.



Unit Goal: Provide a variety of marsh habitats for migratory birds, including deep open water, and moderate to shallow emergent vegetation.

Objectives: Establish greater plant diversity and more emergent vegetation. Reduce floating vegetation (lily) percentage.

Strategies: Drawdown to continue encouragement of plant diversity desired, but should coincide with repair of common dike with Pool 1. Manage at more moderate pool levels around 572.5 to encourage developing emergent plants. Monitor for problem PL areas. Consider open to lake level management if conditions permit.

Management Strategy Constraints: Unit has a history of purple loosestrife infestations, particularly along the SE corner. Deterioration of common dike with Pool 1.

Repairs Needed: Common dike with Pool 1 has severe deterioration and could be compromised by holes at any time.

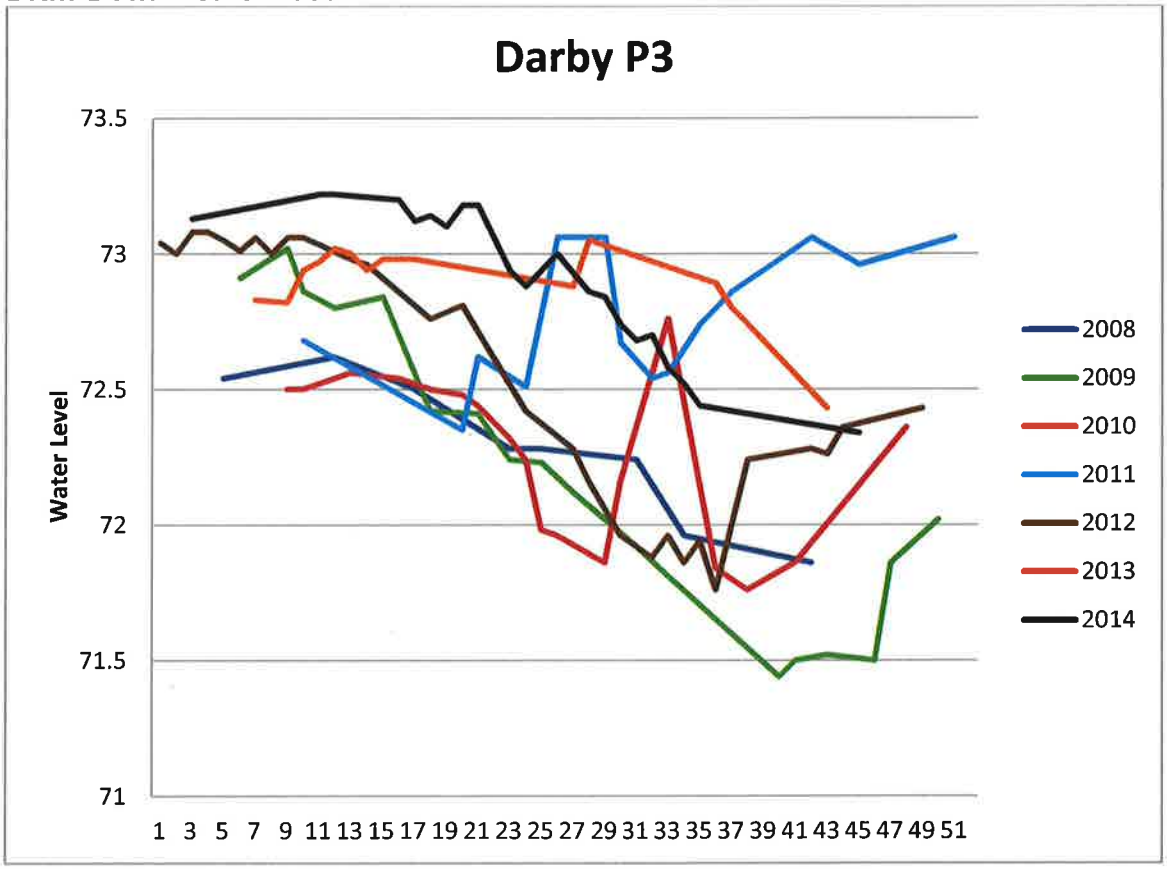
Unit: **Darby Pool 4** Full pool ~573.5, which puts water on south end. More appropriate level for most of unit may be 572.0-572.5.

Add 510 to gauge reading.

Week #	Desired water level	2014 Date	Actual Water level Staff reading	Notes
				Manage at mid-level around 572.5 to encourage
				emergent vegetation development. Consider open to
		Mar.		Lake level if conditions permit.
		Apr.		
		May		
		June		
		July		
		Aug.		
	571.8	Sept.		
		Oct.		

Unit: Darby Pool 3

Acres: 24.2
2014 Activity: Natural hydrological conditions **2013 Activity:** Natural hydrological conditions. **2012 Activity:** Water in unit throughout year, added water in September. Limited bird use.
2011 notes: Ditch flowing into unit in July bringing water level up needed to add a board to the agri drain to hold water in unit.
Draw Down Years: 2006?



Unit Goal: Provide resting and foraging habitat for migratory birds.

Objectives: Provide a combination of both annual and perennial vegetation in a hemimarsh. Increase vegetation diversity, reduce invasives

Strategies: Natural hydrological conditions. Unit condition improvement strategies deferred due to lack of staff and funding.

Unit could use hard drawdown and disking. Purple loosestrife consequences could be severe however. Could also try smashing smartweed with marsh master.

Management Strategy Constraints: Full pool is limited by low spots is south dike. Agridrain is currently set at maximum possible level, which puts water on top of south dike low spot during heavy rainfall events. Purple loosestrife can be an issue. Much of unit is monotypic smartweed.

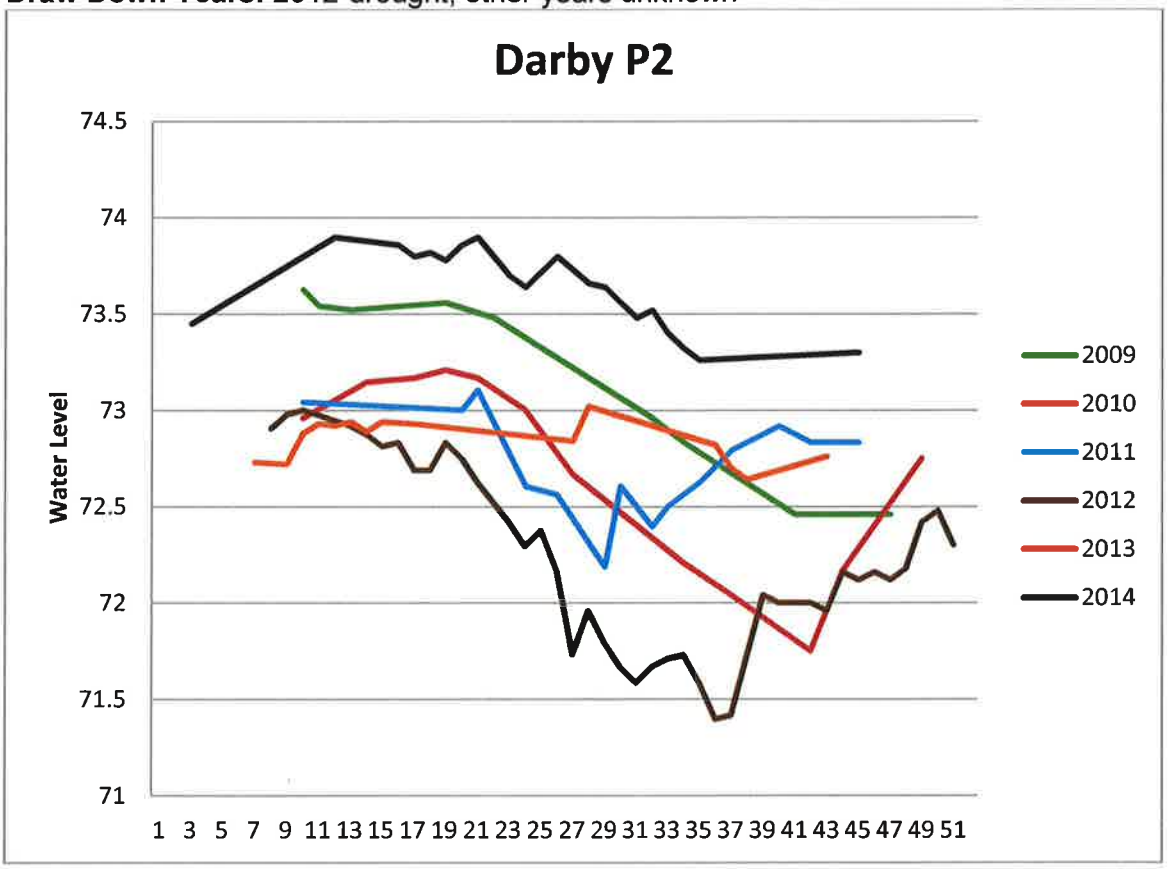
Repairs Needed:
II. South dike needs raised

Unit: **Darby Pool 3** Full pool 572.5, 573.0 with water on south dike.
Add 510 to gauge reading.

Week #	Desired water level	2013 Date	Actual Water level Staff reading	Notes
				Natural hydrological conditions.
				– Flash ~~dam~~ if needed for source material
		Mar.		
		Apr.		
	2.5-2.6			
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		

Unit: Darby Pool 2

Acres: 34.8, includes some high ground without water.
2014 Activity: Added additional board to manage at higher water level. **2013 Activity:** Natural hydrological conditions. **2012 Activity:** Unit had mudflats by September due to drought, added water end of September.
2011 notes: Boards are set at 60" seems to be a good level for this unit. 63 or 64" is about full pool.
Draw Down Years: 2012-drought, other years unknown



Unit Goal: Provide resting and foraging habitat for migratory birds.

Objectives: Increase vegetation diversity, decrease significant PL population.

Strategies: Natural hydrological conditions. Unit condition improvement strategies deferred due to lack of staff and funding. Determine full pool level, see if can add additional boards to agridrain.

Consider drawdown, spray, and disk of purple loosestrife. Long term management options could include conversion to forest, with management as a green tree reservoir.

Management Strategy Constraints: Significant purple loosestrife issues.

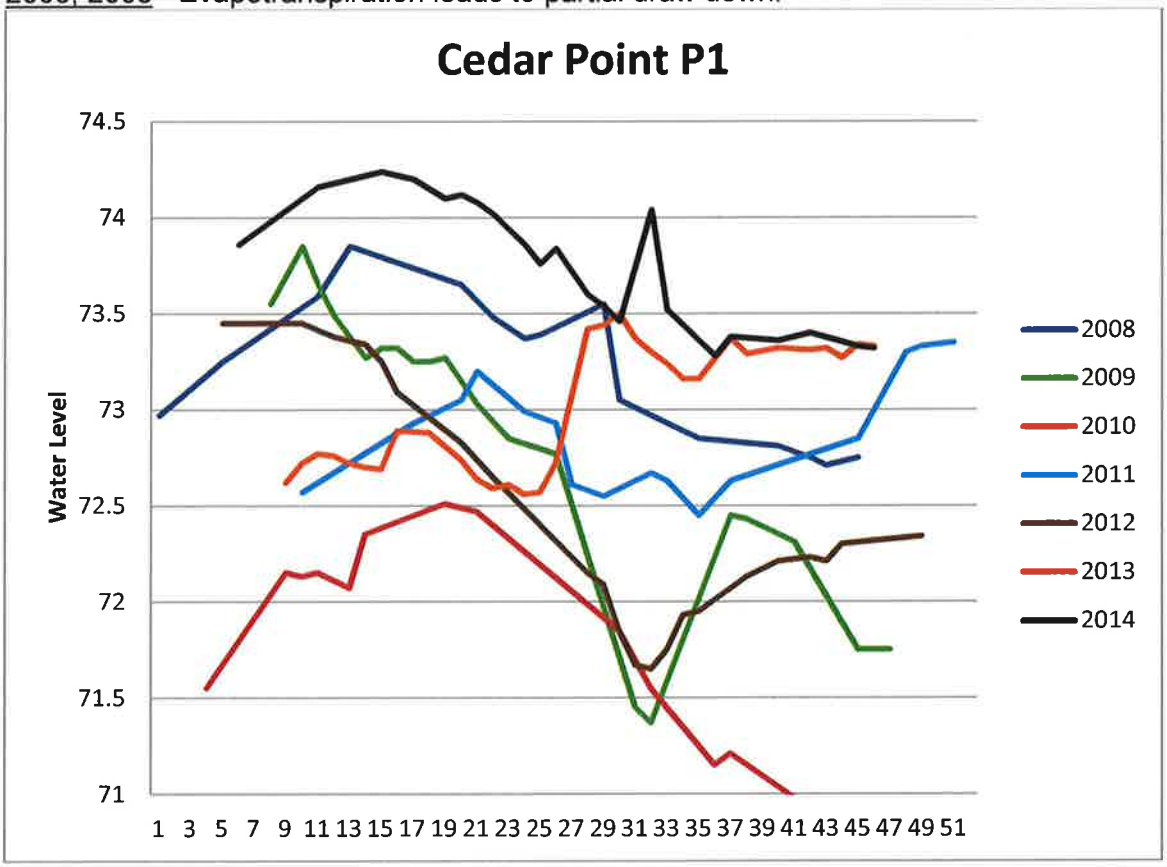
Repairs Needed:

Unit: **Darby Pool 2**. Determine full pool level.
Add 510 to gauge reading.

Week #	Desired water level	2014 Date	Actual Water level Staff reading	Notes
				Maintain high water >573.5. See if unit can
				support higher levels by adding additional boards
		Mar.		in agridrain.
		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		
63"64"				

Unit: Cedar Point Pool 1

Acres: 1,444.3, excludes fishing pond area.
2014 Activity: Unit at very high levels all year due to compromised water management. Use as source water to Pool 2 in fall, and high water taken off within limits of buildup blocking pump inside the marsh. **2013 Activity:** Partially cleaned lake intake. Pumped in for about 1 month June-July. Aerial spray PL and Phrag. **2012 Activity:** Partial drawdown due to drought, added water when possible. Blocked failed west structure to prevent water loss. Pump intake eventually silted in. Pump intake cleaned spring 2013, but only in first part of raceway. Excellent wild rice production.
2011 notes: Unit stayed consistent all year. Siltation is blocking the lake intake. In December free flowed water from pool 1 into lake we also opened pool 2 to let water flow into pool 1 because 2 was too high.
Draw Down Years: 2010- was a true drawdown due to drought. 2012, 2009, 2007, 2006, 2005 - Evapotranspiration leads to partial draw down.



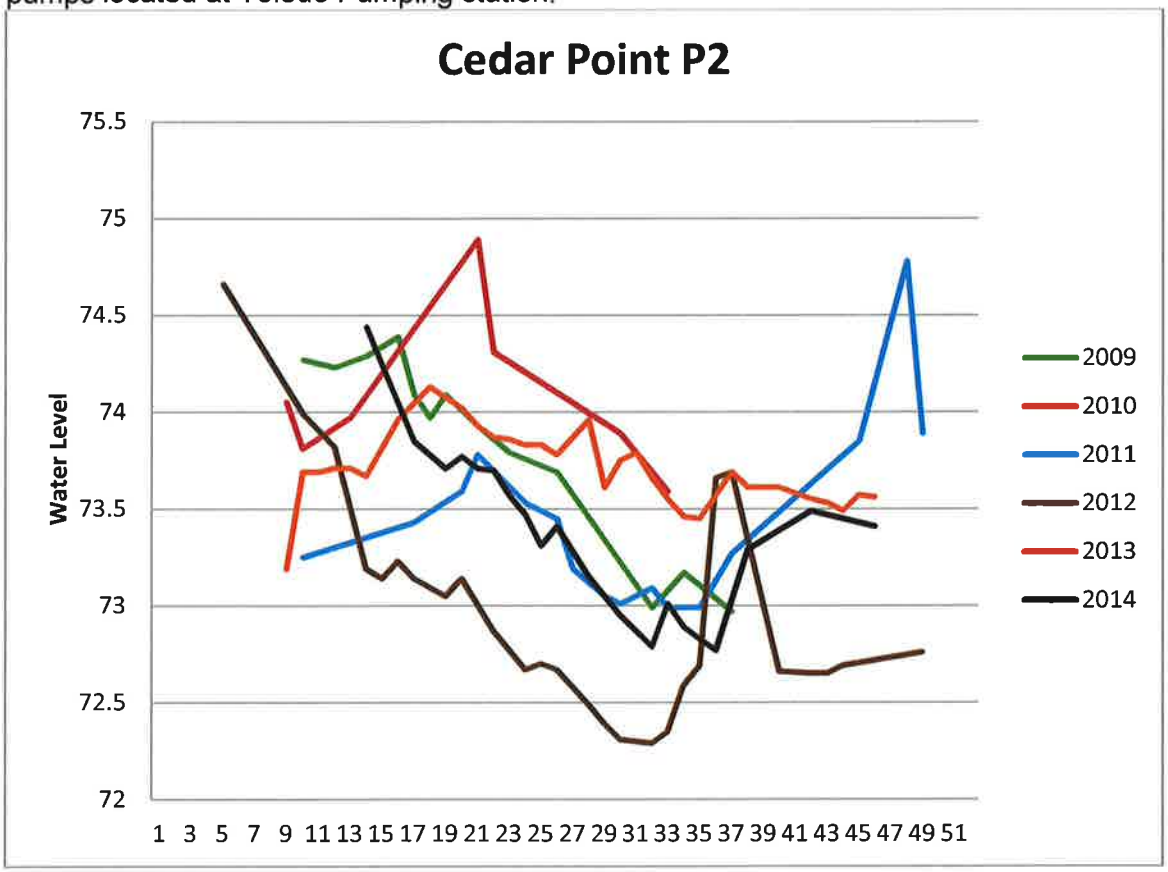
Unit Goal: Provide nesting, foraging, and resting habitat for a variety of migratory birds and wildlife. Maintain populations of rare and endangered plants, such as wild rice.
Objectives: Lack of water control (removal) effectively limits management. Discourage siltation buildup at lake pump intake by flushing out high water from marsh in spring. Replace west WCS with new structure and fish passage in 2015.
Strategies: Blow out pump intake siltation when possible during low seiche events. Remove high water in spring within limitations-~573.4 to aid construction and wetland conditions. Evaluate optimal management range once DU bathymetric survey is complete.
Management Strategy Constraints: Limited water management due to west side structure failure, and sand deposition at pump intake. Buildup on marsh side of pump discharge limits water removal to about 573.4.
Repairs Needed: Possible long term project to fix sediment problem in the pump by dredging, both in lake and in unit. West WCS replacement funded 2013.

Unit: **Cedar Point Pool 1** CF: 0=69.75 Full Pool ~573.7?, optimal 572.5-573?

Week #	Desired water level	2014 Date	Actual Water level Staff reading	Notes
		Jan.		Remove high water after ice off during first low
				seiche event. Keep water levels below 573.4 limit.
	3.7- 4.0	Mar.		Then natural hydrological cycle, no other option
				given lack of water control.
				- dredge if possible
		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		

Unit: Cedar Point Pool 2

Acres: 155.5, includes borrow pit, west end to property line
2014 Activity: Added water in fall from Pool 1. **2013 Activity:** Spring burn unit, then added water from Pool 1. Failed pipe at water plant crossing removed, creating open channel between unit and borrow pit. Aerial spray phrag. **2012 Activity:** Nearly complete drawdown due to drought. Aerial sprayed phragmites in fall. **2011 notes:** The gate was opened in June and December to Pool 1 help keep water out of Toledo Water Plant property and to add to pool 1. There are limited management capabilities in this unit.
Draw Down Years: 2007 – unit was pumped down with portable pump and completed by end of May for construction on west dike. Unit was reflooded in November with the pumps located at Toledo Pumping station.



Note: Water readings from gauge in borrow pit do not reflect unit conditions at lower unit levels.
Unit Goal: Provide nesting, foraging, and resting habitat for a variety of migratory birds and wildlife.
Objectives: Manage for hemimarsh conditions, control phragmites
Strategies: Manage as high as possible to stress phrag and encourage muskrats, without flooding Gradel at 2.7 (574.0)—target minimum2.5 (573.8). Add water from Pool 1 if needed.
Management Strategy Constraints: Too high of water backs up onto Toledo water plant and Gradel property due to failure of west dike. Limited options for water management. Water may be able to be added from Toledo pump for a couple of days if treatment for zebra mussels is halted. Significant phrag issues.
Repairs Needed:

I. West end dike eroded away, needs replaced to manage for full pool.
II. IGLD staff plate, placed in unit
III. Need water supply source

Unit: **Cedar Point Pool 2** CF: 0=71.29
Keep water as high as possible, without flooding neighbor's woods (max is 2.70)

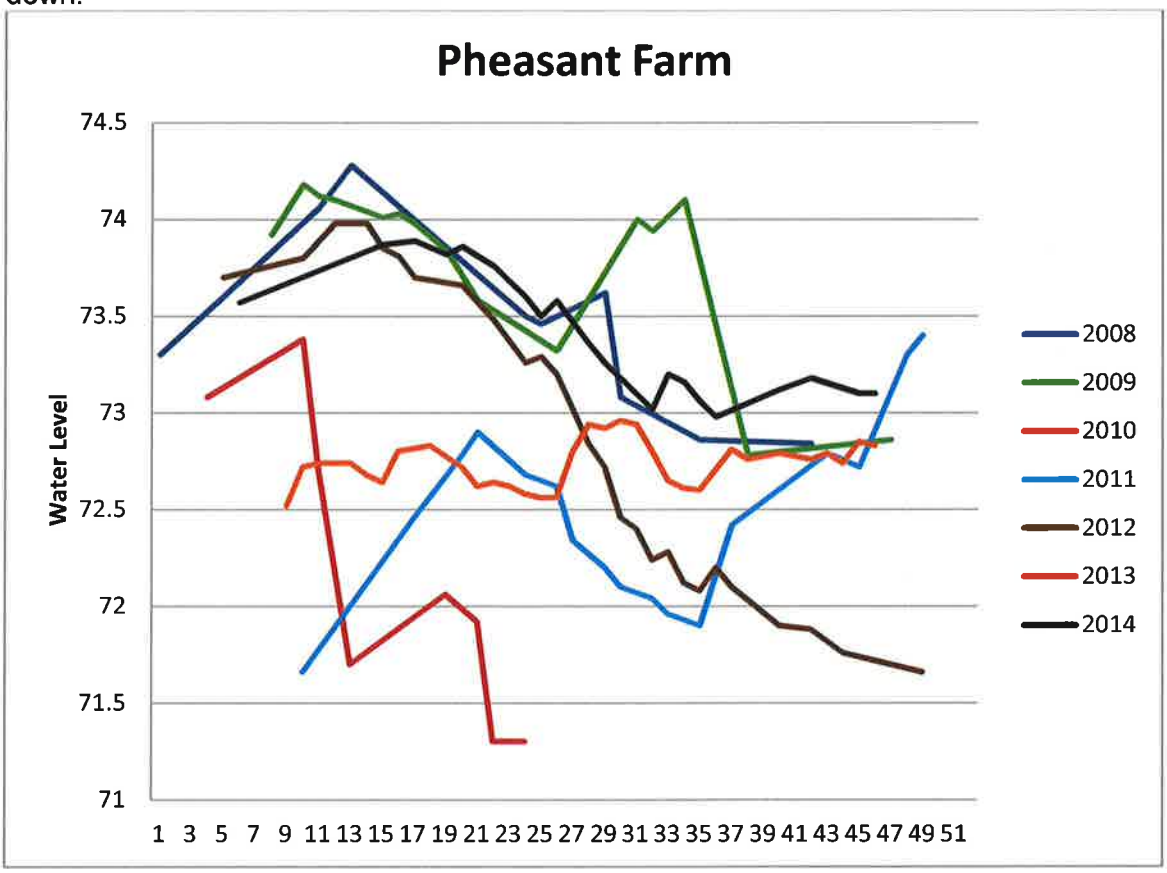
Week #	Desired water level	2014 Date	Actual Water level Staff reading	Notes
		Jan.		Manage high as possible without flooding Gradel
				~2.70, minimum target 2.5. May add from Pool 1
		Mar.		as needed.
		Apr.		
	2.7			
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		

Unit: Cedar Point Pheasant Farm

Acres: 123.9

2014 Activity: Natural hydrological cycle. Bur reed stands developing on north end, possibly due to better water depths resulting from cool summer reducing evapotranspiration. **2013 Activity:** Natural hydrological cycle. Aerial spray phrag. **2012 Activity:** Unit mostly dewatered by end of year, due to drought. Flap gate set to gain water. Aerial sprayed phrag in fall. **2011 notes:** Set WCS to flow in after construction of east dike was complete. No active management. Opened unit to county ditch for drainage in March. Then set up a portable pump to pump out unit for construction. Which began in June. Dikes rebuilt in 2010.

Draw Down Years: 2005- low water & Evapotranspiration led to a late summer/fall draw down.



Unit Goal: Limit invasives. Vegetation structure/type driven primarily by annual rainfall variation.

Objectives: Be opportunistic, limited capabilities due to lack of consistent water source.

Strategies: Monitor and treat invasives, especially phrag. Maintain high water levels within limited capabilities. Set WCS to ditch to flow in. Evaluate WCS to see if structure leaks.

Management Strategy Constraints: Lack of water source other than precipitation.

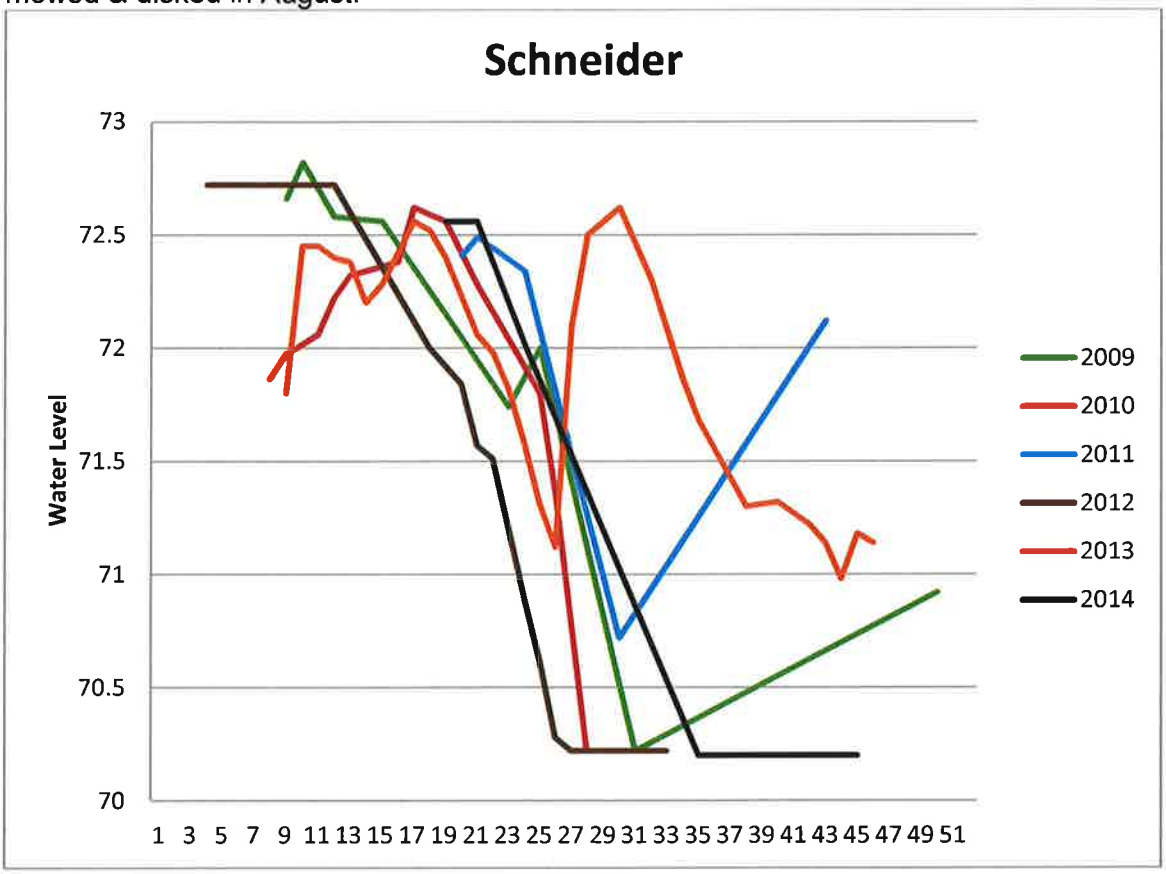
Repairs:

Unit: **Cedar Point Pheasant Farm** Full Pool 574.2?

Week #	Desired water level	2013 Date	Actual Water level Staff reading	Notes
		Jan.		Natural hydrological cycle. Set WCS to flow in and evaluate for leaking.
		Mar.		
		Apr.		
		May		
		June		
		July		
		Aug.		
		Sept.		
		Oct.		

Unit: Schneider

Acres: 38, not all of area has water
2014 Activity: Natural hydrological cycle to normal summer drawdown. Broadcast spray of PL, mowed portion of cattails in fall. **2013 Activity:** Natural hydrological cycle. Aerial spray invasives. **2012 Activity**: Mowed and disked cattail and phragmites.
Draw down years: Annually, lack of water2008- Unit was dewatered by mid June for construction on neighbor to west wetland project. In addition, areas of invasives were mowed & disked in August.



Unit Goal: Limit invasives. Vegetation structure/type driven primarily by annual rainfall variation. Target spring migration for shorebirds and waterfowl by maintaining annual plant or open soil conditions.

Objectives: Reduce invasives, decrease cattail community. Be opportunistic, limited capabilities due to lack of consistent water source.

Strategies: Monitor and treat invasives. Maintain high water levels within limited capabilities. Pump in from drainage ditch if levels permit. If staff time allows, mow and heavy disk in late summer/fall.

Management Strategy Constraints: Lack of water source.

Repairs:

Unit: **Schneider** Full Pool 572.7?, evaluate

Week #	Desired water level	2013 Date	Actual Water level Staff reading	Notes
				Natural hydrological cycle. See if we can add
				another board, check south dike limitation.
				Mow/disk cattail in fall if possible.
				pumps up w/ [illegible]

Notes: Pulling boards to remove water should be done carefully to ensure not to overfill drainage ditch and flood neighbor to the east.

Unit: Blausey East unit

Acres: 32.4 approximate flooded area at full pool
2014 Activity: Periodical pump throughout year as needed. Unit frequently below FSL. Repaired river dike holes. **2013 Activity:** Complex history of watering and dewatering. Pump structure leaks discovered and repaired, but some issues may remain. Holes developed in west river dike, draining unit. One hole repaired, 1-2 more remain at higher water levels. Native seed and plug planting on transitional low water areas. **2012 Activity.** Complete redesign and restoration of unit. Water source from new pump structure. Agridrain for drainage to river. North and south side of entrance road managed as 1 unit, connected by pipe under road.

Unit Goal: Establish a diverse, native marsh plant community. Provide habitat for migratory, nesting, and resident species with a full range of water depths from moist soil to deep, open water. Filter agricultural runoff from county drainage ditch when possible.

Objectives: Prevent invasives, monitor for response of native seed bank and seeding/plugs. Determine management capabilities/issues/limitations.

Strategies: Fill to full pool when possible, using county ditch as source whenever possible. Monitor and further evaluate throughout year for additional water level manipulation needs. Determine appropriate level for agridrain board. Monitor and treat invasives.

Management Strategy Constraints: Gradual transition to high ground creates zones for invasives colonization. Water supply from river sometimes limited, especially in fall.

Repairs: Install IGLD gauge.

Unit: **Blausey East** Full Pool:

Desired water level	Week #	2014 Date	Actual Water level Staff reading	Notes
				Fill to full pool, evaluate. Monitor for river dike holes.
				Pump as available and needed in unit from county ditch.

Unit: Blausey West unit

Acres: 99.7

2014 Activity: Pump as needed throughout year to maintain water flow through fish passage. Water levels generally moderate to low, with some mudflat areas made available to shorebirds in fall. Reflooded to moderate level before winter, but was limited by lack of consistent water at river intake. **2013 Activity:** Complex history of watering and dewatering. Pump structure leaks discovered and repaired, but some issues may remain. Installed Osprey platform, with 2 osprey using structure, but too late to nest. **2012 Activity.** Complete redesign and restoration of unit. Water source from new pump structure. North and south side of partial spur road managed as 1 unit at high levels, but disconnect at road and high ground at lower levels.

Unit Goal: Provide benefits of a connected coastal marsh ecosystem, including fish access, spawning, and nursery habitat; flood storage; and water quality benefits. Filter farm water runoff from county drainage ditch. Establish a diverse, native marsh plant community. Provide habitat for shorebird and waterfowl migration.

Objectives: When lake levels permit, operate unit as open to lake to provide maximum ecosystem benefits and fish passage. Provide sufficient water supply to operate fish ladder when unit is disconnected from lake. Whenever possible and needed, pump water from county drainage ditch for water source and water quality treatment. Prevent invasives, monitor for response of native seed bank. Evaluate for fall partial drawdown for shorebirds and waterfowl. Determine management capabilities/issues/limitations.

Strategies: Fill to full pool in spring and maintain there if possible to discourage dense cattail and encourage muskrats, and operate fish ladder. Pump from county ditch whenever possible to provide water quality benefits. Work with USGS and Stone Lab to monitor fish use of ladder. Monitor and further evaluate throughout year for additional water level manipulation needs. Monitor and treat invasives.

Management Strategy Constraints: Water supply from river sometimes limited, especially in fall.

Repairs: Install IGLD gauges on both sides of spur road.

Unit: **Blausey West** Full Pool:

Desired water level	wk #	2014 Date	Actual Water level Staff reading		Notes
			North	South	Fill to full pool, evaluate.
		Jan.			Pump as available and needed in unit from county ditch.
		Feb.			
		Mar.			
		Apr.			
		May			
		June			
		July			
		Aug.			
		Sept.			
		Oct.			
		Nov.			
		Dec.			

Navarre

Security Supervisor: 419-321-7557

Limited monitoring of area. No refuge management of water levels. Can pump out of but not into units. Try to do a better job of monitoring water levels.

Unit	Week #	2014 Date	Actual Water level Staff reading	Notes Drawdown Pool 3
				Higher water as possible Pool 2
				excavator? - connection 6W 2+3

Other Satellite Properties

Diefenthaler:

2009 Activity: Evapotranspiration led to a draw down in June, except for main channel. Draw Down Years: 2009 & 2008 – Evapotranspiration led to draw down in August except for main channel. It was flooded again in November from rains; 2007 - July, the unit was mistakenly drawndown. No activity on 2010

2011-2014 Maintain full pull, floats set to come on to prevent flooding into barn.

2015: monitor, pump sometimes fails to start. Explore installation of passive high water outflow pipe.

Kontz:

2009 Activity: Unit is currently open to lake levels. The wetland remained flooded throughout entire season (Spring-Fall). Hairy willow herb was treated on the upland just south of SR 2 and before the woods. Very little hairy willow herb was found along the wetland transitional areas.

No activity in 2010

2011-2013 Unit open to turtle creek via failed structure under SR2- no active management.

2013: West field created 4 scrape/small berm seasonal wetlands. Native planting of seeds by drilling in field, hand broadcast in wetland, and prairie cordgrass plugs in wetland transition wetlands. Treatment for invasives by CWMA.

2014: Monitor and treat invasives

2015: Monitor and treat invasives

Helle:

2009 Activity: No active management.

March & April 2009: water was across all of unit and base of hill on SE side property owner. Water was in woods all the way to road.

2011- Take off high water in Nov-Dec. Entire unit flooded to road, and water backed up with farm field.

2012-Restoration by routing north field water to wetland via scrapes and agridrain, installed agridrain from wetland to river.

2013-Set agridrain boards to full pool levels for north side scrape and for wetland.

2014: Pulled north side boards at ice off for native tree planting. Planting completed spring.

2015: Monitor and treat invasives — check level = open to river?

Gaeth-Kurdy:

2009 Activity: Eric maintained sump pump in ditch behind his house. This pump is very costly and should be replaced with regular pump.

2011- In general, pump when necessary to prevent flooding.

2012-2013-no activity?

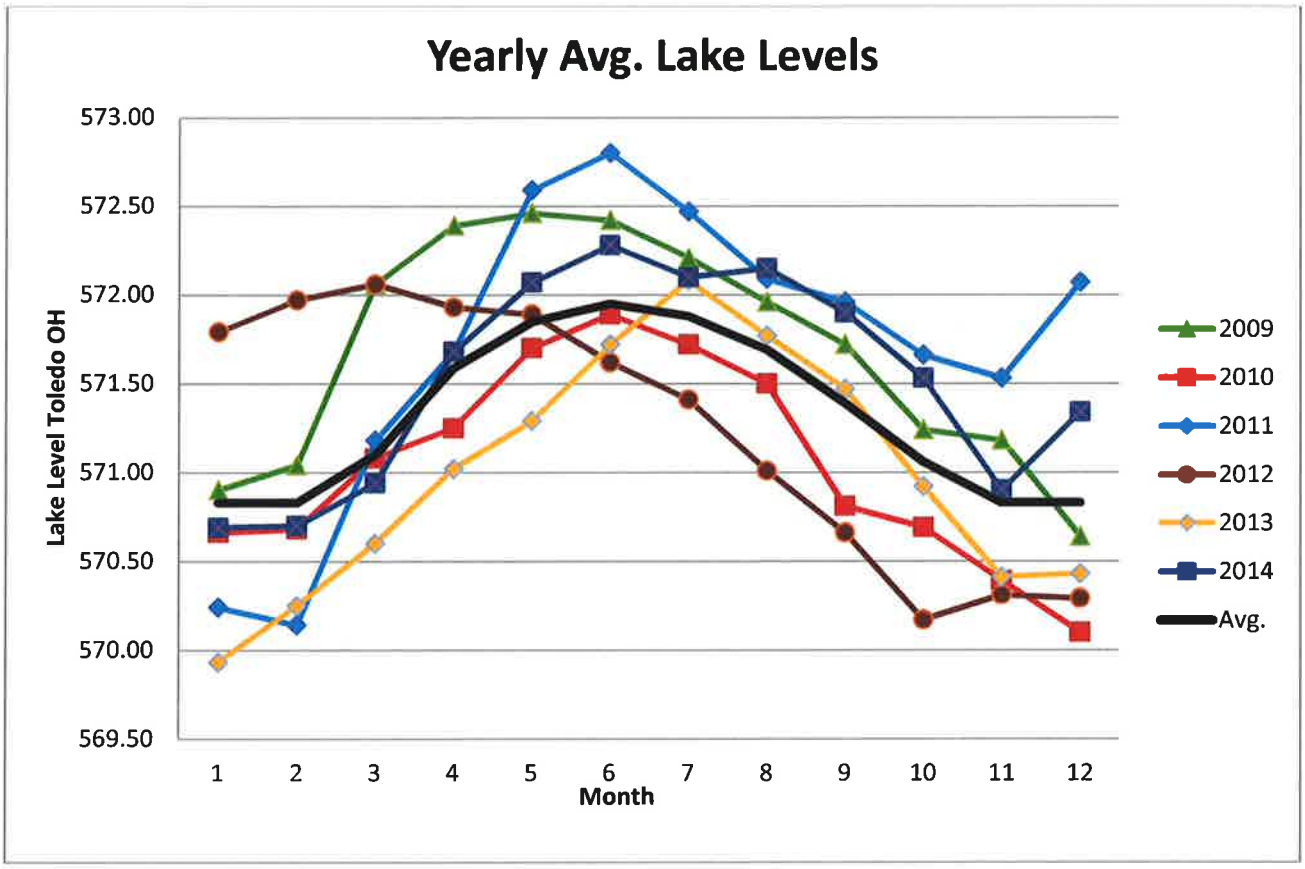
2014: pump failure

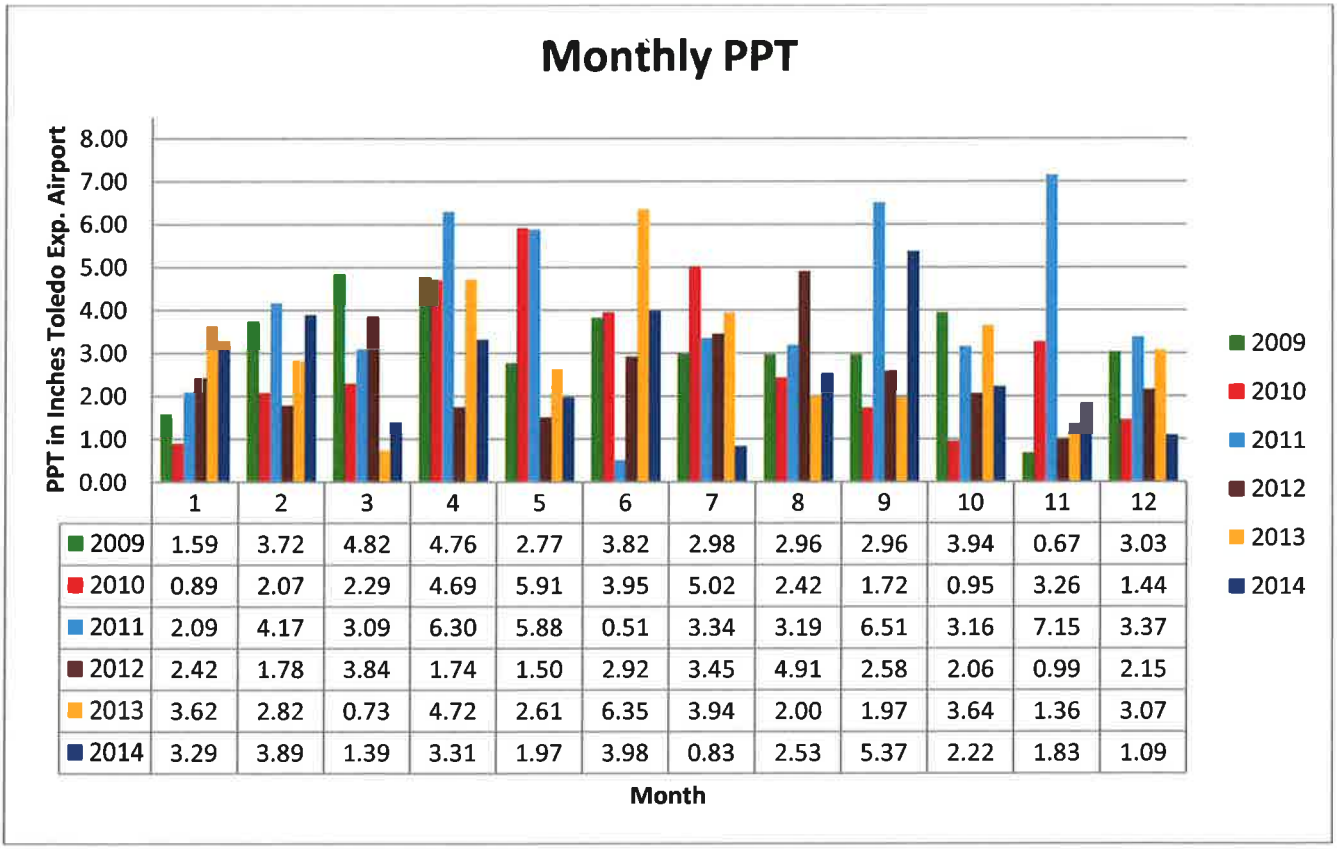
Boss:
2009 Activity: A stop log structure was installed on the drainage ditch, and the driveway culvert was replaced because it had collapsed.
2010- Field not flooded
2011- Field flooded in May for shorebirds, boards removed late May, only partially down because road ditch is so high boards added in Dec. to hold water.
2012-2013-Set boards in prior year December to capture winter water, flooded early spring for shorebirds, pulled boards prior to crop planting to avoid flooding adjacent landowner to west. Light disking of flooded area in fall.
2014: GLRI restoration of dike, scrapes, and agridrain to allow longer flooding for shorebirds and teal.
2015: Spring planting of trees, shrub, and wet meadow zones along south side. Set boards to capture water in wetland, but at limited depth because dike seeding needs to occur in spring.

Adams:
2013-Property acquired in fee title.
2014-Monitor and treat invasives
2015-Full unit evaluation

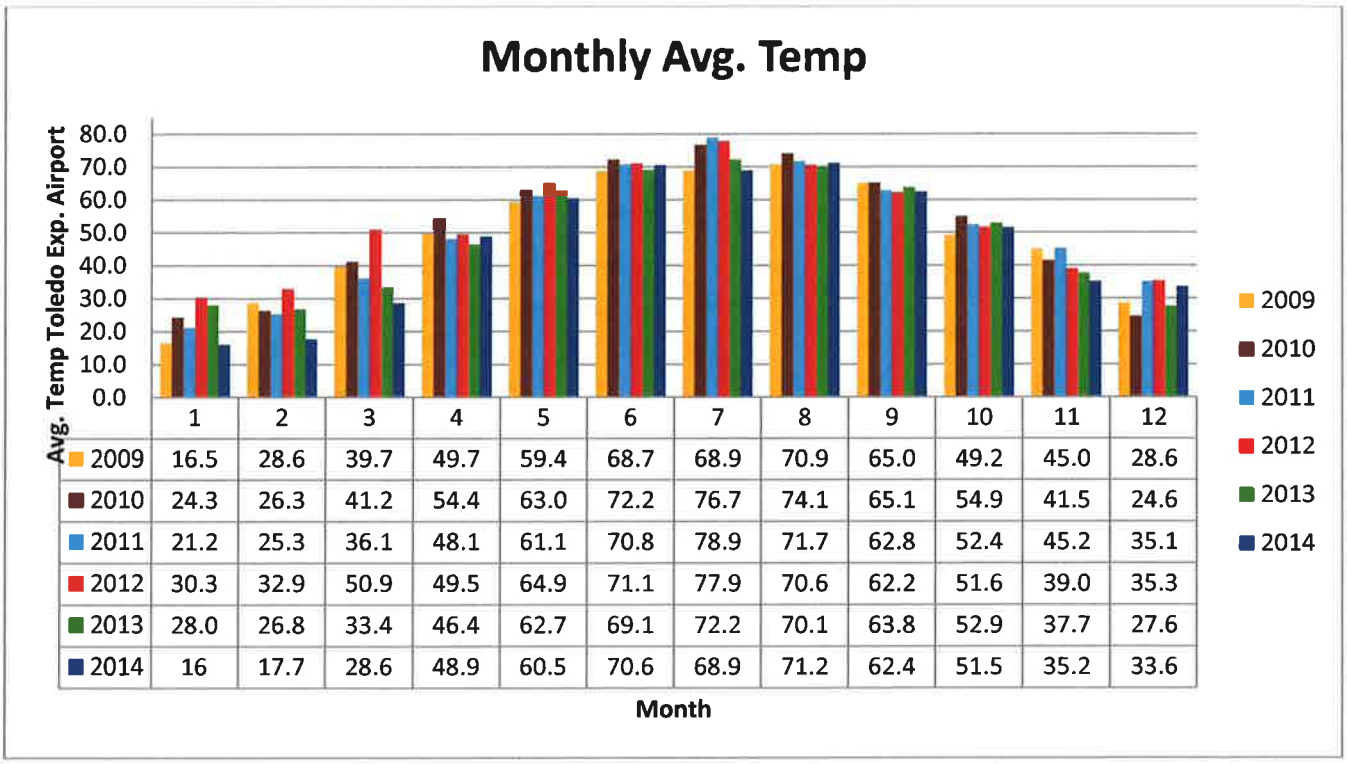
Knorn:
2015: Property acquired in February. Evaluate conditions and operation needs.

Other Important Activities:
FU2: Reforestation within possible area. Significant pumping required to remove high water, but still limited planting area.
FU 10: Reforestation planting in spring south of woodlot, except for low depression.
Raptor Alley: Reforestation planting in spring of about 5 acres, immediately west of overflow parking lot.
FU 9: Planned spring reforestation planting of 30 acres under GLRI.





	1	2	3	4	5	6	7	8	9	10	11	12
2009	1.59	3.72	4.82	4.76	2.77	3.82	2.98	2.96	2.96	3.94	0.67	3.03
2010	0.89	2.07	2.29	4.69	5.91	3.95	5.02	2.42	1.72	0.95	3.26	1.44
2011	2.09	4.17	3.09	6.30	5.88	0.51	3.34	3.19	6.51	3.16	7.15	3.37
2012	2.42	1.78	3.84	1.74	1.50	2.92	3.45	4.91	2.58	2.06	0.99	2.15
2013	3.62	2.82	0.73	4.72	2.61	6.35	3.94	2.00	1.97	3.64	1.36	3.07
2014	3.29	3.89	1.39	3.31	1.97	3.98	0.83	2.53	5.37	2.22	1.83	1.09



	1	2	3	4	5	6	7	8	9	10	11	12
2009	16.5	28.6	39.7	49.7	59.4	68.7	68.9	70.9	65.0	49.2	45.0	28.6
2010	24.3	26.3	41.2	54.4	63.0	72.2	76.7	74.1	65.1	54.9	41.5	24.6
2011	21.2	25.3	36.1	48.1	61.1	70.8	78.9	71.7	62.8	52.4	45.2	35.1
2012	30.3	32.9	50.9	49.5	64.9	71.1	77.9	70.6	62.2	51.6	39.0	35.3
2013	28.0	26.8	33.4	46.4	62.7	69.1	72.2	70.1	63.8	52.9	37.7	27.6
2014	16	17.7	28.6	48.9	60.5	70.6	68.9	71.2	62.4	51.5	35.2	33.6

NOTES:

Pumping and Water Control Structure Operations

Pump/WCS/Unit	Start/Open Date/Time	RPM	Hours	End/Close Date/Time	Hours	KWH	Maintenance	Notes